Dynamics of ICT Resources for Instructional Delivery in Selected Secondary Schools in Narok County, Kenya

By

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Abstract

In order to support and encourage the use of Information and Communication Technology (ICT) in secondary schools, the government of Kenya through the Ministry of Education (MoE), selected 5 public secondary schools in each sub-county and provided funding for ICT infrastructure and teacher training through the Economic Stimulus Package program (ESP-ICT).However, studies indicate that teachers' use of ICT for instructional delivery is still low. Therefore, the objective of the study was to find out the adequacy of ICT resources for instructional delivery in ESP-ICT funded secondary schools in Narok County. Descriptive survey research was used in the study. The sampled population consisted of 9 principals who were selected through purposive sampling from the 9 ESP-ICT funded schools. From each school, stratified random sampling was used to select teachers from five academic departments where 90 teachers were selected. Additionally, 9 computer teachers were purposively selected from each school, giving a total of 108 respondents. Questionnaires, interview schedules and observation schedules were used for data collection. Quantitative data was analysed using descriptive statistical methods such as frequencies and percentages. Analysed data was then presented using tables, pie charts and bar graphs. Qualitative data was organised thematically and presented through narrations. The study revealed that, there was some level of inadequacy of the ICT resources in secondary schools in Narok North and Narok South sub- counties. However, utilization of ICTs by teachers for instructional delivery was still low. This report was attributed to inadequacy of the ICT resources and short training period.

Key words: Narok County, Kenya, Adequacy, ICT Resources in Schools.

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1.0 Introduction

Today, hardly any aspect of human endeavour can be effectively conducted without Information, Communication and Technology (ICT). According to Broadly (2012), ICT is rapidly evolving, therefore, learners need to be taught using technology and not only about technology. As a result, ICT should be used to complement the roles of teachers in the classroom and make learning easier for the students (UNESCO, 2004).

Research shows that ICT is having a major impact on classroom instruction particularly in more developed nations such as New Zealand, USA, UK, and Japan among others (Becta, 2008). Availability of ICT enables teachers and students to access more teaching and learning information. For instance, internet and its resources provide access to information and instructional materials which might not have been readily available to students and teachers within a classroom setting. The use of ICT, hence, provides teachers with an opportunity to improve their content delivery. Because of this, learners' performance is improved due to enhanced teacher-to-student collaboration, improved class participation and learning (Gilakjani, 2013).

In recognising the importance of applying ICT in education, the government Kenya established the Kenya ICT fund in order to mobilize funds and resources to help set up ICT infrastructure in all schools in Kenya (MoE, 2006). In order to attain this, the government established model institutions for training master integrators and teachers on ICT integration in teaching and learning. In regard to this, in 2009, the government started the Economic Stimulus Package programme (ESP-ICT component). One of the objective of this programme was to provide funds that will facilitate acquisition of basic ICT resources in the selected secondary schools.

In Narok County, two sub counties namely Narok North Sub County and Narok South Sub County each had five secondary schools identified and funded to purchase ICT infrastructure (MoE, 2006). Each school was to be equipped with: 11computers, 1 printer, 1 projector, 1 Uninterrupted Power System (UPS), Local Area Network installation and internet connectivity. In the study, these schools were referred to as ESP-ICT funded secondary schools.

For effective integration of ICT in classroom instruction, adequacy of ICT equipment is necessary (Yonazi et al, 2012). However, there is evidence to show that Kenya is still struggling to provide ICT equipment and infrastructure to schools (Farrell, 2007; Oloo, 2009; Mwingirwa, 2012 and Kirimi, 2012). The schools under study were provided with the basic ICT resources to enable them integrate ICT in classroom instruction. However, it was not clear whether these resources were adequate for effective use in instructional delivery. This study, therefore, sought to establish the adequacy of the ICT resources provided in the selected schools in Narok County.

1.1 Statement of the problem

The Kenyan government appreciates the role that education can play in diffusing the ICT knowledge and skills into social and economic development. Through the Ministry of Education, it is committed to ensure that schools integrate ICT in teaching and learning. In this regard, it has budgeted and equipped some secondary schools with ICT resources and ensured capacity building in the area of ICT integration in schools through the ESP programme. However, despite this high investment, little is known by way of research if the ICT resources availed to the selected schools are adequate for instructional delivery.

1.2. Objectives of the Study

To find out the adequacy of ICT resources for instructional delivery in the selected secondary schools in Narok County.

1.3 Review of Related Literature

ICT use in Education

With the rapid changes in technology, economy and the society in general, the education system is expected to prepare students to be able to deal with jobs and technologies that are yet to be explored. The content and methodologies of teaching and the instructional technologies used need to change to address the changes in the world. From history, three important periods of ICT use can be identified. These are, the main frame period, the microcomputer period and the internet period (Aslan & Reigeluth, 2011).

The main frame period was between late 1950s to late 1970s. Shortage of teachers necessitated the introduction of computers in the education system. Computers were first used as teaching machines. The initial applications of computers according to Aslan & Reigeluth, (2011) were implemented using the IBM's Teaching Machines project. They were used both as tutees and tutors. They were used as tutors through drills and tutorials. Little was known about computers during this period and computer literacy was an obstacle to use therefore it was difficult to expect effective use in the classroom.

The microcomputer period was from the late 1970s to the end of 1990s. In this period, microcomputers were introduced in kit form, after which commodore pet, apple and TRS-80 took their places in the educational sector. Due to availability and increased use of computers, literacy levels also went up. The common use in education during this period was Advanced Drill and Practice applications and tutorials. Computers were not used to teach new content but rather to reinforce and help retain what has already been delivered. In addition to drill and practice, intelligent Tutoring Systems were widely used in universities. Further, Database Management systems, word processing, spreadsheets and drawing tools were also used. With this system, students could store, organize and manipulate data for class work (Aslan & Reigeluth, 2011). According to Aslan & Reigeluth (2011), this system was used as study guides, students were expected to analyse stories and fill their findings in the database. Visualization in instruction was seen as an important aspect of helping the learners retain their understanding of new material. As such this tool gained a lot of popularity and computers were commonly used as tools for enhancing instruction (Aslan & Reigeluth, 2011).

The internet period was the period of early 2000s to date. The internet became an important tool in education (Kruger, 2012). According to Internet World Stats, (2010), the use of internet in education has greatly improved worldwide. Of the 2095 million users of internet by 2011, 5.7% are in Africa, 13% in North America, 22.7% in Europe, and 44% in

Asia. Benefits of internet in education as documented by Ivers (2003) include, helping teachers to set their own pace of teaching and adopting individual teaching techniques which become more available with the presence of the internet; saves time for the teacher and administrators thus allowing the teachers more time with the students and collaborations and communication among teachers parents and students is improved. Computer technologies of this period include networked personal computers, wireless, web 2.0 technologies and portable computers. Most of these technologies are still new and thus their use in education is just beginning.

Other emerging trends of ICT use in education include, the Open Source Technology, Mobile learning, Social Networking in Education and Blogs in Education. According to Kruger (2012), Open Source Technology is software that is distributed at no cost, with the acquirer having the right to modify the source. As such it becomes an appropriate and affordable alternative to dependence on commercial organization for educational materials. According to UNESCO (2013), mobile learning can be used in education to expand and enrich educational opportunities for learners in different settings. Mobile devices like mobile phones and tablet computers are becoming a common source of accessing information, streamlining administration and facilitating learning in new ways. Mobile learning has advantages like reducing costs of infrastructure, increased global access to educational materials and improved quality of education (UNESCO, 2013).

Another trend that is revolutionizing the education sector is Social networking. This is an online service for communities of people who share an interest with one another to collaborate. Students spend a lot of time using social networking services. These services provide a casual place for learning; encourage learners to express their views and thoughts; provide effective collaborations and communication; enhance student learning experiences and build an online learning community; share educational resources; form discussion groups and provide a sense of belonging (Kruger, 2012). Blogs in education is a web page made up of short, frequently updated posts. Teachers and learners can therefore benefit from these blogs. Educational blogs can be used for networking, personal knowledge sharing, getting tips for learners, reading links, reflective writing, submission of assignments, sharing resources and collaborative works (Kruger, 2012), (UNESCO 2013).

From the above it is clear that for education systems to offer quality learning experiences, they have to evolve and adopt ICTs in classroom education.

Importance of ICT Use for Instructional Delivery

Information Communication and Technology (ICT) can be defined as electronic or computerized devices, assisted by human and interactive materials that can be used for a wide range of teaching and learning as well as for personal use (UNESCO, 2014). Its use has become mandatory in almost all sectors of modern life, and being a great agent of change and diffuse of ICT, education is at the forefront of embracing it.

ICT has the ability to enhance education access and consequently improving learning outcomes. It can advance the learners' academic qualities through promoting higher order thinking, improved problem solving skills and deep understanding of concepts taught (Tinio, 2002).

The current generation of students in most schools in Kenya are technology oriented and would enjoy ICT supported learner centered methods of teaching and learning. ICT can therefore be used as a main tool to enhance student participation and independence in learning (UNESCO, 2014). ICT according to studies has the ability to encourage and promote

collaboration among learners (Tinio, 2002). This is a positive aspect since collaboration promotes learning. A research by Tella et al. (2007) in Nigerian secondary schools indicated that the teachers who use ICT felt that their use of ICT benefited the learners by stimulating their interest in learning, enhancing retention and hence triggering learner response in giving feedback. In Kenya, studies by Kirimi (2012) in Kangema and Mwingirwa (2012) in Tigania East and Wabuyele, (2006) found that over 90% of the teachers believed that increased use of ICT improved students' achievement, made the lessons more interesting, led to a deeper understanding of the content and also increased interaction among the learners and even teachers. Collaboration among the teachers affords them an opportunity to share different classroom strategies and resources. Collaboration also helps to focus, affirm and propagate for better practice, which can result from discussions during collaboration (Valtonen, 2011).

According to Kiptalam and Rodrigues (2010), ICT can help a teacher in lesson preparation, presentation of lesson content, scoring and recording students' marks and communication to fellow teachers. This consequently improves learning outcomes. A study of physics teacher's use of ICT in classroom instruction in Nairobi county indicated that majority of the teachers strongly agreed that ICT improves lesson preparation and lesson delivery (Mwanaszumbah, 2014).

Given its benefits, Farrell, Glen and Shafika (2007) in their survey of 53 African countries reported that ICT in education is in transition. Countries are no longer experimenting; rather most of the ICT implementations are being guided by national ICT policies. It appears that many developing nations are now using ICT to support learning, (Farrell et al 2007).

Adequacy and Use of ICT Resources for Instructional Delivery

The ICT resources referred to include ICT equipment and infrastructure, digital content, internet and time available for teachers to integrate ICT in classroom instruction. The equipment generally include desktop computers, laptops, printers, radios, televisions, overhead projectors, CD-ROM, smart boards, Video/VCD machines among others (UNESCO, 2014). In Kenyan schools, the commonly used ICT equipment are computers, printers and projectors. Others are internet, educational CDs and DVDs and KICD supplied digital content (Hew & Brush, 2007). Governments have realized the need for improved access and use of information technology as an important aspect for development. Hennessy, Harrison & Wamakote (2010), points out that availability of ICT resources greatly determine whether teachers' will integrate ICT for classroom instruction. Lack of these resources according to them drops the teachers' interest to use ICT in the class. However, Teo, Lee, & Chai (2007) in their study concluded that availability of ICT resources is not a vital determinant of whether the teacher will or will not use them in classroom instruction. This could be true in a situation where the resource are available but are not in good working condition or are not enough in relation to the number of students (Kumar, Rose, & D'Silva, 2008).

In a study of Bangladesh schools, it was observed that schools had computers, however lack of up-to-date computers and software limited their use (Farrell et al, 2012). Many organisations, governmental and non- governmental have been seen to donate computers and other ICT resources to schools in the country (World Bank, 2011). A big percentage of the schools now have computers. However, studies show that these resources are not adequate. The computer student ratio is still high in many areas especially in developing nations. In a recent study by Kiptalam and Rodrigues (2010), it was observed that

access to facilities was averagely one computer to fifteen learners in most schools. This ratio is still high given the size of most computer laboratories in the schools. Spacing observed in most schools is limited thus not able to accommodate many students per computer. This is however a great improvement compared to the study by Farrell, 2007 where the ratio was 1:150 in developing nations.

Additionally, inadequacy of resources is affecting integration of ICT in classroom instruction in several parts of Kenya. In a study conducted in Kangema for instance, indicated that 88% of the schools had computers but they were not adequate for effective integration in classroom instruction (Kirimi 2012). In Nairobi County, a study by Mwanaszumbah (2014) reported that, the ESP supplied resources were equally not adequate. In addition 11% of the schools had totally no use of ICT due to vandalism of the provided resources. In such situations it becomes difficult for teachers to integrate ICT in classroom instruction.

Kiptalam & Rodrigues (2010) in their study found out that in Kenya, the sampled teachers had access to ICT equipment both at schools and home. However, only a small percentage had access to relevant digital content for classroom integration. Availability and even adequacy of ICT resources and equipment may be irrelevant without relevant digital content. In Nairobi County, 67% of the schools had basic ICT equipment but integration in classroom instruction was still low in these schools because of lack of relevant digital content. Teachers only had access to information in the internet which was not in line with the current curriculum thus find it difficult to incorporate in their day–to–day teaching (Mwanaszumbah, 2014). It is therefore vital to have access to relevant digital content for effective integration.

With access to internet, digital content and teaching materials may be obtained from private suppliers or by downloading it online. This, however, may have challenges since this may mean going an extra mile for the school in terms of funding and also for the teacher in terms of time and competency of locating the information online. This study therefore sought to establish if the ESP funded schools had adequate digital content and internet access. Access to ICTs also involves ensuring that the resources are placed in convenient locations within the school where all teachers and students can use them. Many also observe that availability of a free laboratory increases access to ICTs by the teachers and students (Andoh, 2012, Korte & Husing, 2007).

This study established whether location of access to ICT affects integration in classroom instruction. In addition to having access to adequate ICT resources, it is important that the teachers are given enough time to use them in classroom. Lack of time for planning and using ICT in classroom can hinder integration by the teachers (Dang, 2011). In a study of physic teachers in Nairobi County, it was established that 44% of the teachers had no time to prepare for ICT use in classroom and therefore did not use ICT in their classroom instruction. A good number (55%) of them also indicated that the school had not allocated time on the timetable for ICT use in classroom (Mwanaszumbah, 2014). Studies by Kirimi (2012) and Mwingirwa (2012) indicate that a number of teachers complained of having many lessons per day, and hence could not get time to plan and prepare for ICT integrated lesson, considering that they also had co-curricular activities to take care of. With the pressure to finish the syllabus on time, teachers put all their energy on the strategies that can help them in that, and avoid any other activity that may disrupt syllabus completion. ICT use is seen as one of those aspects that might slow the teacher down, especially if time is not intentionally provided for preparation and use in classroom.

From the reviewed literature it is evident that utilization of ICT for instruction in schools is essential and important if learners are to fit in the global society. In addition, the use of ICT by teachers for instructional delivery is evolving and faces many barriers therefore, poses a great challenge to many teachers.

For efficient utilization of the ICT for instruction, teachers need to evolve and adopt emerging ICT in classroom teaching. Some key factors have also been identified to influence ICT utilization. These are availability, adequacy, relevance and access to ICT resources. There was a disparity in literature on whether availability of adequate operational resources influences use of ICT or not. Some studies stated that availability influences ICT use while others said that the availability of resources has no effect on ICT use. The study, therefore, sought to address this gap.

3.0 Research Methodology

In the study, descriptive survey research design was used. The design was chosen to enable the researcher to gather information on ICT utilization without manipulating the variables. Further, according to Orodho, 2012, the design provides a quantitative description of the state of the parameters of study. Since the practice of ICT utilisation in secondary education is still in its emerging stages in Kenya, the design provided a quantitative description of the extent to which ICT resources are adequately provided and utilized by teachers for instructional delivery in the selected secondary schools in Narok County.

The study was conducted in Narok County; Narok North sub-county and Narok South sub-county. The locale was chosen because the schools already have some ICT resources therefore the researcher believes the schools have the needed information to meet the objectives of the study. The area was also accessible to the researcher.

The study targeted 9 public secondary schools (2 extra county, 3 county and 4 sub-county level schools) that received ESP funding to purchase ICT resources in Narok North sub-county (5) and Narok South sub-county (4). In addition, 9 principals and 365 teachers were also targeted.

The researcher used purposive sampling to select 9 schools that received ESP funding to purchase ICT resources and train teachers in Narok North sub-county (5) and Narok South sub- county (4). Stratified sampling was used to group teachers according to departments. A proportionate stratified random sample was obtained for each stratum using the formula: [(Sample size / population size) x stratum size].

The names of teachers in each department were then put in a tin and shaken to avoid bias and the simple random sample was picked giving a total of 90 teachers. According to Orodho (2012), stratified random sampling is free from systemic bias and it enables the researcher to estimate the probability of a finding occurring solely by chance. It gives each individual in the population an equal chance of being selected. Table 3.1 summarizes the sampling frame for the subject teachers.

Table 3.1 Sampling Frame for Subject Teachers

Department	Mathematics	Sciences	Humanities	Languages	Technical	Total
No. of teachers	40	62	82	70	59	313
Sample size	12	18	23	20	17	90

Source: Field Data 2019

In addition to this, all the 9 computer teachers from each school were purposively selected in the sample because they have the best understanding of the dynamics regarding ICT in the school. Furthermore, all the 9 principals from the 9 schools participated in the study because of their role of resource acquisition and management of ICT equipment in schools. A total of 108 participants were selected for the research.

A questionnaire was used to collect teachers' views on adequacy and utilization of ICTs for instructional delivery. Questionnaires were used because they are easy to administer to a large group of respondents (Orodho, 2009). Further, questionnaires were used in order to give the respondents the liberty to give their views freely and make honest suggestions without the fear of being identified. A closed fixed interview schedule was designed to collect information from principals on adequacy and utilization of ICT for instructional delivery. Closed fixed interview schedule was found more flexible in allowing the researcher to collect more information from the respondents (Mugenda and Mugenda, 1999). An observation schedule was used to observe the available ICT resources in the sampled schools. The guide had a table with columns containing a list of items to be checked. The items were on availability, adequacy and utilization of ICT resources.

In this study, content and construct validity of the research instruments were instigated from the design stage. The principals' interview guide and school observation schedule were scrutinized and approved by supervisors during discussion sessions to determine whether the items were logical and would provide needed information. A test-retest method was used to establish the reliability of the research instruments. This was done within a span of two weeks. A correlation coefficient of 0.713 was obtained, which was considered reliable enough since the coefficient obtained was above 0.8 (Orodho, 2009).

In the study, quantitative data was analysed using descriptive statistical methods like frequencies and percentages and presented using tables, pie charts and bar graphs to give meaning to the data. Qualitative data was organised into themes according to the research objectives and presented through narrations (Orodho, 2012). The interpreted data was discussed and inferences made. Consent was sought from all the respondents and the relevant authorities. Confidentiality of the respondents was also ensured. The report was tested for plagiarism to ensure that it is original.

4.0 Research Findings and Discussions
Availability of ICT Resources
The observations made by the study concerning the availability of ICT resources in ESP schools were presented in table 4.1 below.

Table 4.1: Availability of ICT Resources

ICT resources	Available		Not available	
	Frequency	Percentage	Frequency	Percentage
Desktop Computer	9	100%	0	0%
Overhead projectors	5	56%	4	44%
Laptops	5	56%	4	44%
Printers	5	56%	4	44%
KICD digital content	9	100%	0	0%
Internet	7	78%	2	22%
Educational DVDs & CDs	7	78%	2	22%
Computer laboratory	9	100%	0	0%
Electricity	8	89%	1	11%
Technicians	4	44%	5	56%
		n = 9		

Source: Field Data 2019

From the study, it was found that 9 (100%) of the schools have desk top computers while 7 (78%) of the schools have internet and educational DVDs & CDs. The study also established that 5 (56%) of the schools have overhead projectors, laptops and printers. Only 4 (44%) of the schools had technicians. Most of the schools 8 (89%) had electricity supply. It was also found that 1 (11%) of the schools use solar power as an alternative source of electricity.

The data shows that majority of the schools have ICT resources installed in their schools. Hennessy, Harrison & Wamakote (2010), points out that availability of ICT resources greatly determine whether teachers could use them for instructional delivery. Availability however according to studies is not a guarantee for use in instructional delivery (Teo, Lee, & Chai, 2007) and Kumar, Rose, & D'Silva 2008). This could therefore explain why the schools in Narok North and South are not using ICT for instructional delivery yet they have some form of ICT resources.

Adequacy of the ICT Resources

Responses by teachers concerning availability and adequacy of the ICT resources are as presented in Figure 4.1 below.
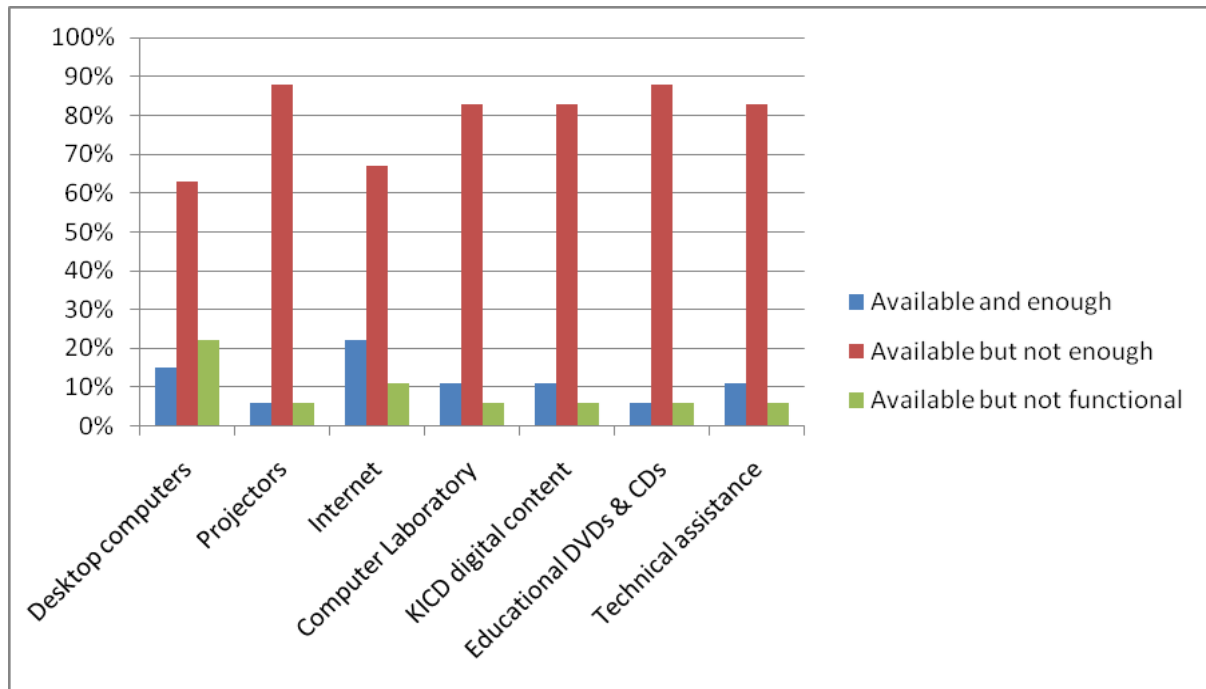

Figure 4.1: Teachers' Responses on Availability and Adequacy of ICT Resources
Source: Field Data 2019

As indicated in figure 4.1, ICT resources were available to the teachers but were not adequate. Only 15% of the teachers indicated that the desktop computers were adequate for classroom integration. Projectors (88%) and KICD digital content (83%) were not adequate to the teachers. However, 50% of the teachers indicated that computer laboratories were available and adequate for instructional delivery.

Despite ICT resources being available in all schools, findings showed that they are not enough to facilitate efficient use for instructional delivery.

When resources are inadequate, the likelihood of being used by the teachers is also minimal. From the data collected, averagely, most schools had for instance, 10 desktop computers to be used by a class of about 50 students on average. This therefore indicates that averagely, 5 students shared one computer. Given the spacing in the computer lab observed in most schools, five students use one computer. This in most circumstances discourages the teacher from using ICT resources citing difficulties in class control.

This study agrees with that of Kirimi (2012) which also found out that in Kangema 88% of the schools studied had computers but they were not enough to cater efficiently for classroom integration.

Usage of desktop computers which is available in all the studied schools is also likely to be affected by the inadequacy of overhead projectors, of which only 6% of the schools indicated they were enough and digital content which despite being available in all schools was inadequate (83%) for classroom integration. This finding agrees with that of Teo, Lee, & Chai (2007) and Kumar, Rose, & D'Silva (2008) whom in their studies concluded that

availability of ICT resources is not a vital determinant of whether the teacher will or will not use them for instructional delivery. This could be true in a situation where the resources are available but are not in good working condition or are not enough in relation to the number of students. In this study, 22% of the teachers reported that the desktop computers available were not in good working conditions. In a study of Bangladesh schools, Farrell et al., (2012) also observed that schools had computers, however, lack of up to date computers and softwares limited their use.

Only 11% of the teachers reported that technical assistance was available and adequate. This indicates that majority of the teachers did not have the needed technical assistance. Limited technical support in schools leads to little or no technical maintenance of the computers resulting to higher risks of breakdowns (Becta, 2008). This according to Andoh (2012) limits maximum use of the computers by the teachers especially in schools that are in remote places.

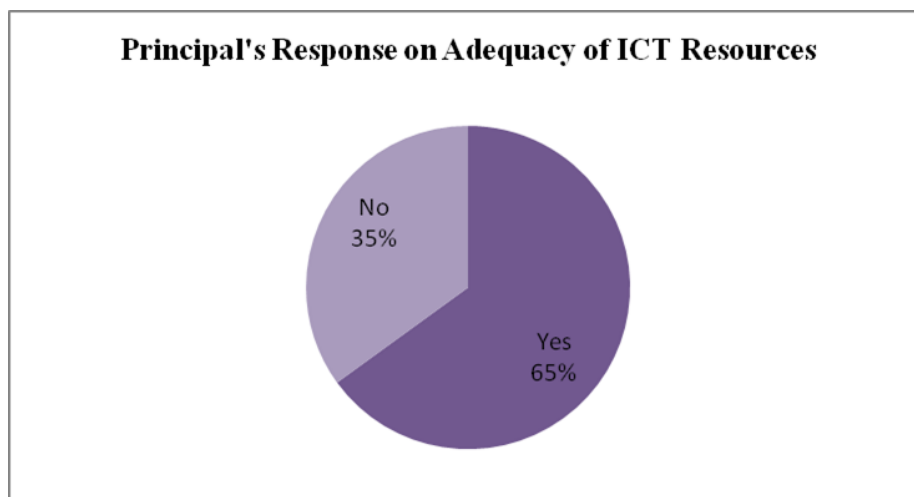**The principals' responses concerning adequacy of ICT resources is presented in figure 4.2 below.**

Figure 4.2: Principals' Responses on Adequacy of ICT Resources
Source: Field Data 2019

Sixty five percent (65%) of the principals interviewed indicated that their institutions have enough resources to enable use of ICT for instructional delivery. This is contrary to what the teachers reported and what was observed. Only 35% of the principals indicated that the resources were not enough. All the principals who indicated that they had sufficient resources also indicated to have received some resources from other sources (BOM, PTA and NGOs) apart from the ministry. This is a clear indication that there is some form of inadequacy in ICT resources especially in schools which are unable to acquire resources from other sources. Responding to the question whether they were planning to acquire more ICT resources, 56% said 'Yes', whereas 44% said 'No'. Sixty two percent (62%) expected the resources to be supplied by PTA, 20% by BOM, 12% by MoE and 6% by donors. It is also evident that what was supplied by the ministry through the ESP program was not adequate.

This study therefore, agrees with Mwanaszumbah (2014) who observed that access and Adequacy of ICT resources was the main challenge facing ESP schools in Nairobi County. All principals in the study also indicated a plan to acquire more ICT resources, however, only

eleven percent indicated the timeline. Disparities were also noted in terms of management of the supplied resources, despite every school being uniformly funded, differences were seen in the resources available in the schools. It is clear that the ESP program was not yet successful since the resources supplied to the schools were not enough for teachers to use for instructional delivery. More therefore needs to be done.

Extent of Utilization of the ICT Resources
Teachers' responses on frequency of use of the ICT resources are presented on Figure 4.3
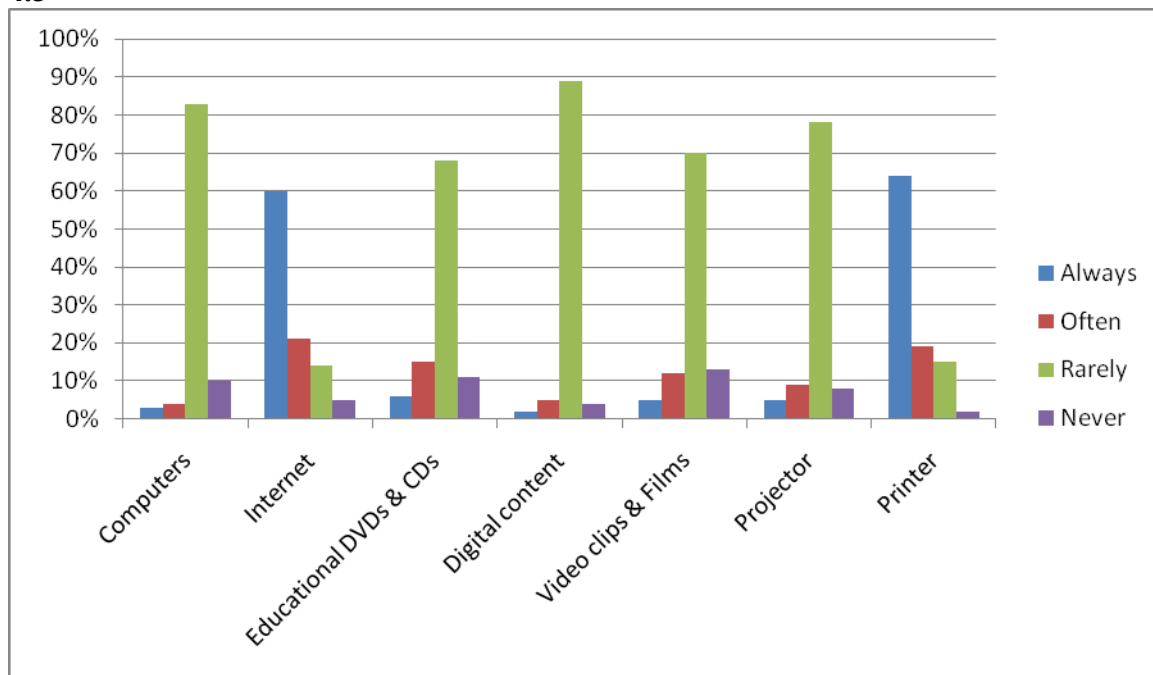

Figure 4.4: Teachers' Frequency of Using ICT Resources
Source: Field Data 2019

The resource that many teachers always use is internet (60%) and the printer (64%). The other resources like common software on the laptop and desktop computers (83%), Educational DVDs & CDs (68%), Digital content (89%), Video Clips and short films (70%) and the projector (78%) were rarely used. Majority of the teachers rarely use ICT resources available for instructional delivery.Sixty six percent (66%) of the principals reported that their teachers use the ICT resources available in the school. However, most of them pointed out that the use was general. Most of the teachers according to the principals used ICT to carry out general tasks like printing out exams, communicating to fellow teachers and personal work. This study is in agreement with Mwingirwa (2012)'s study, where 67% of the schools had computers, but 26% used them for general purposes and not for classroom instruction. Wambeti (2009) found that 25% of the teachers did not use computers at all, 36% did not use Internet and 37% did not use software at all. Gabriel a., et al (2014) in their study of Lagos lecturer found out that resource utilization was low. Despite the resources being available in all ESP schools in Narok North and South, utilization for instructional delivery is still low. This could be attributed to lack of access, time and other teacher factors like teacher ICT competence and perceptions.

Availability of Time to Use ICT for Instructional Delivery

	Strongly Agree	Agree	Disagree	Strongly disagree
There is time allocated for ICT use on the school timetable	11%	54%	23%	12%
ICT time allocated is enough to use ICT in classroom	6%	25%	50%	19%
There is enough time for preparing an ICT supported lesson	8%	29%	52%	11%
		n = 96		

Source: Field Data 2019

Access to the ICT Resources

Low levels of ICT utilization could also be because of limited access to the available resources. Seven per cent (7%) of the teachers indicated that they access ICT resources from the HOD's office, 4% access them from the library and most teachers (89%) indicated that they access the ICT resources in the computer laboratory. This was confirmed by the principals who 89% reported that teachers had access to ICT resources in the computer laboratory only. On the other hand 11% said that teachers have access to the ICT resources in other places other than the laboratory. This is limiting given the number of students and lessons available on the school master timetable. On average, each school had only one computer lab which had to be used by almost all teachers and students in the school. These findings are in tandem with Ouma et al., (2013) and Jude & Dankaro, (2012), who also established that most of the teachers had limited access to technology resources and thus limited use in classroom teaching.

Time is also an important element in utilization of ICT for instructional delivery. Teachers need time to practice the skill they have acquired through training. It is therefore of great significance that the teacher be allowed sufficient time on the school time table to practice and use ICT. Teachers' responses on the effect of time on ICT integration in classroom instruction is presented in Table 4.2 below.

Table 4.2: Effect of Time on Utilization of ICTs for Instructional Delivery

Sixty five percent (65%) of the teachers either agree or strongly agree that there is time allocated on the school timetable for the teachers to use ICT for instructional delivery. However, 69% of the teachers felt that this time was not enough to use ICT for instructional delivery. Only 31% of the teachers either agreed or strongly agreed that the time was enough. On time for preparing for ICT supported lessons, 63% of the teachers indicated that they had no time, whereas 37% indicated that they had time. These findings show that teachers generally agree that time has been allocated for ICT use on the school time table but it was not enough. On the other hand, most of the teachers also feel that they do not have enough

time to prepare for ICT supported lessons. This results to the teachers not using ICT for instructional delivery.

Principals' responses regarding time allocation for using ICT for instructional delivery were presented in figure 4.3 below
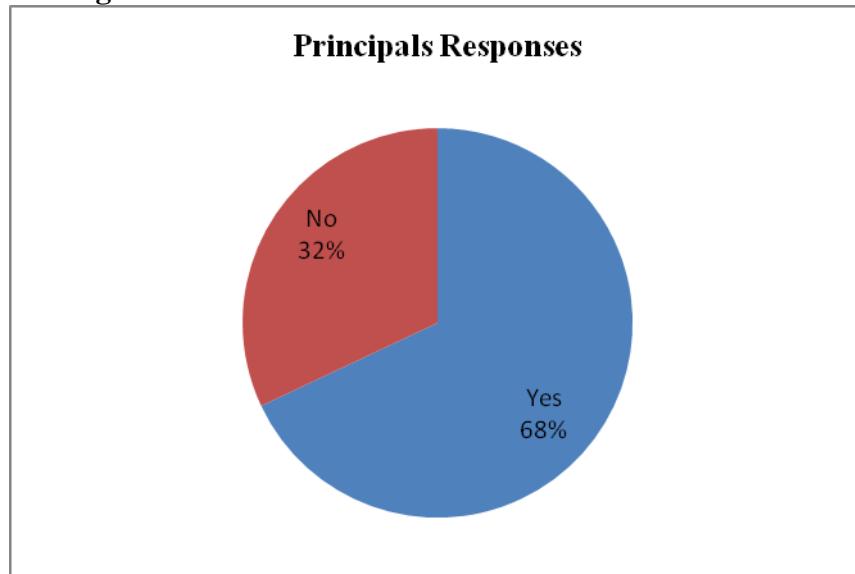

Figure 4.3: Principals Responses on Time Allocation for ICT Use
Source: Field Data 2019

Sixty eight (68%) of the principals indicated that they have allowed time on the timetable for teachers to use ICT for instructional delivery. Despite this, most of them felt that the time allocated was not being used for that purpose due to the pressure of syllabus completion. Others pointed out that due to shortage of teachers, the available teachers have a huge workload. This makes them to have no extra time left to prepare for ICT supported lessons. These findings support what most of the teachers pointed out.

According to Dang (2011), on average, an ICT supported lesson needs the teacher to have approximately 2-3 hours of preparation. Given that schools run in a scheduled timetable, most teachers will only work within this stipulated time which in most instances is limited. This therefore means that teachers do not present their lessons using ICT due to limited time (40 minutes for a single lesson). All this according to Hennessy et al., (2010) discourages the teachers from using ICT for instructional delivery.

These findings are in tandem with Kirimi (2012), Mwingirwa (2012) and Mwanaszumbah (2014), who also indicated that limited time was hindering teachers from integrating ICT in classroom instructions in Kangema, Tigania East and Nairobi County respectively.

Conclusion
Based on the research, this study concluded that most of the schools had inadequate ICT resources. The resources (desktop computers, laptops, projectors, printers, digital content, and internet) were not enough for the teachers to effectively use for instructional delivery. Since the resources were inadequate, most of the teachers rarely used them. This resulted to low ICT use for instructional delivery.

Recommendations

In relation to availability and adequacy of ICT resources, though majority of the schools have ICT resources installed in their schools, the study recommends the following:

i) Improvement of the existing ICT resources for use in instructional delivery.

ii) Endeavour in setting up of new ICT resources (i.e. desktop computers, laptops, printers, projectors, digital content, network setup, internet and internet facilities), in relation to the school population to ensure effective use of ICT for instructional delivery.

iii) Adequate funds should be allocated to the secondary schools in Narok County for servicing of the relevant hardware components and ensuring reliable connectivity. This will reduce the interruptions during classroom use.

Recommendations for Further Research

i) A comparative study on public secondary schools and private secondary schools in Narok County adequacy and use of ICT for instructional delivery can be done.

ii) A similar study can be conducted in other counties that received funding for Stimulus Package program for ICT infrastructure for schools.

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