

# Use of Computers in Supervision of Curriculum in Secondary Schools in Seme Sub-County, Kisumu County, Kenya

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**Abstract:** The purpose of the study was to explore the use of computers in supervision of curriculum in secondary schools in Seme sub-county, Kisumu County. Objectives that guided the study were: to find out challenges facing use of computers in supervision of curriculum in secondary schools and to find out mitigation measures on effective use of computer in supervision of curriculum in secondary schools. Descriptive survey research design was used. A Technology Acceptance Model Theory and Conceptual Framework were used. The study populations were 193 teachers, 95 HOD's and 95 key school officials. Saturated random sampling technique was employed to pick out a sample of 19 principals, 193 teachers, 95HODs and 95 key school officials. The instruments of data collection were questionnaire, interview and document analysis. Reliability of the instruments was addressed through piloting in 4 schools within the sub-county. Test retest method of reliability was employed to ascertain the reliability co-efficient of the instruments at 0.6. Validity was conducted through expert judgment by the two supervisors. Quantitative data was analyzed using descriptive statistics while qualitative data was analyzed in an ongoing process as themes and sub themes of the study emerged. On the concern about challenges facing use of computers, the study found out that insufficient number of computers, lack of computer skills, resistance to change, shortage of power, lack of computer resources and lack of support from school management were real threats to the use of computers in supervision of curriculum. On the issue of mitigation measures, the study established that the government should be in the forefront to purchase computers for secondary schools, change of attitude in favour of use of computers, training of staff and administration personnel and availing of computer resources. It was concluded that benefits on use of computers in curriculum supervision have not yet been tapped in secondary schools. It was recommended that schools should espouse the use of computers in implementing curriculum supervision as a yardstick of efficiency in curriculum delivery. A study on the extent of use of computers in supervision of curriculum supervision in secondary schools would broaden the understanding of the current study.

**Keywords:** Acceptance Model Theory and Conceptual Framework, curriculum in secondary schools.

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## 1. INTRODUCTION

### 1.1 Background to the study:

Educational institutions world over have revolutionized the way they manage their data in which processing computer based information systems have been adopted as a tool to support managers in their management duties (Webber, 2009). Webber (2009) points out that despite the success registered in the use of information technology in other sectors of economy, educational institutions have lagged in the integration of computers for schools management purpose. Studies conducted in development countries in USA, the United Kingdom, France and Canada indicate that computer has the

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potential of improving the efficiency and effectiveness of school manager's administrative duties (Graca, 2008; Someketh, 2010). In their study on need for computer technology holds the power for effective transformation of schools management and consequently for the improvement of schools. He underscores the importance of computer and reflects on the latest development initiated by African governments to leap into information age by citing Rwanda's ambitious computer program of mapping all schools within three years using wireless access.

By 1970's countries such as United State of America, Netherlands, Australia, Hong Kong and Mexico had computerized their school's management tasks mainly maintenance of payroll, financial reporting and accountings (Cunningham, 2006; Bozeman et al, 2011). There is growing need to evaluate benefits of computer and to create opportunities for capacity building that will ensure their beneficial use and absorption within schools (Bessom 2006). He further stresses the need for African government to utilize science and technology in education sector. Marker Wallace and Macnamara(2008), note that, recent innovations have led to cutting edge information and communication tools specifically relevant to need of school managers. Mudhai (2009) underscores the importance of computer and reflects on the latest developments initiated by African governments to leap into the information age and gives example of achievements in Nigeria, Egypt, Mozambique and Rwanda that have established high level multi-sector task for computer in school management.

Netherlands reported that computer has enabled effective management of tasks related to the students' assessments, timetabling, administrative records and financial accounting the report notes, the important driver in the computer developmental success in USA is adoption of a computer policy and the existence of a computer strategy. Britain has kept pace due to government findings through the local education authorities and the education reforms act of 1988 that compelled the central government to make budgetary provisions for education technology (Williams, 2008).

Although developing countries have become aware of the invaluable use of computer in the management and administration of schools, they have been able to make significant progress in its implementation. In study carried out in Malaysia in 1994 under the Malaysia smart school initiative it was found that computer policy plan has been evolved, but have not been fully integrated in administration and management of school system (Zain, et al 2008). In sub Saharan Africa, countries such as South Africa and Botswana have gone a long way in adopting an exemplary approach to integration of computer in school systems (Kituyi and Adagun, 2008). In recognition of computer in management of the catalytic role that information plays in national development, Kenya developed its initial Computer National Policy in 2003 (MOEST, 2006) the policy framework document that emphasized the need for use of computers in supervision and management of secondary schools

Education technology by definition, applies current knowledge for some useful purpose. Therefore, technology uses knowledge to adapt and improve the system to which the knowledge applies (Seattler, 2010). Historically the system of management in secondary schools is based on sound record keeping so that irrespective of the top management, the records from the basis for administration control and decision making at all levels In the 1980's computers were not only in routine administrative tasks, but also in all steps of decision making Process, namely: problem identification, prioritizing of criteria, data organization and implementation of school plans (Fisher, 2011).

In the case of Ethiopia's education system, computer use in supervision of curriculum particularly the computer and internet is very much limited though there is a clear policy direction. Awareness creation and preparation to use computer and the internet for learning seems promising. The promise founded itself on the launching of WoredaNet, an e-government communication and the computer strategy, which are the major enablers for the fast development of computer use in the country (Hare, 2007).

The implementation strategy of the country, also called computer for development plan number 6 has three broad categories as described by (Hare, 2007). These are (1) the Ethiopian National School Net initiative that is aimed at networking 500 schools and the utilization of computers to facilitate the teaching-learning process at primary, secondary, technical and vocational schools, (2) the National computer use in Higher Education Initiative that focuses on orchestrating computers within universities, colleges, and research institutes to facilitate student learning, research activities, and community services, and (3) the national Computer Education, Training and Awareness Initiative that promotes computer awareness and literacy, adult education and lifelong learning, and virtual distance learning in the country. However, the most challenging condition to implement computer strategy in Ethiopian schools is inadequacy of existing infrastructures. Even though integrating computer use in the teaching-learning process was given due recognition

in the implementation strategy, only about 40 percent of schools in the country have computers, and most of which are in Addis Ababa, causing a rural-urban divide to equity and access for quality education. Moreover, those schools, which have computers, experience limited or low access to internet connections.

The report notes, the important driver in the computer developmental success in USA is adoption of computer policy and the existence of computer strategy. Britain has kept pace due to government findings through the local education authorities and the education reforms act of 1988 that compelled the central government to make budgetary provisions for education technology (Williams, 2008). Although developing countries have become aware of the invaluable use of computer in the management and administration of schools, they have been able to make significant progress in its implementation. In study carried out in Malaysia in 1994 under the Malaysia smart school initiative it was found that computer policy plan has been evolved, but have not been fully integrated in administration and management of school system (Zain, et al 2008). In sub Saharan Africa, countries such as South Africa and Botswana have gone a long way in adopting an exemplary approach to integration of computers in school systems (Kituyi and Adagun, 2008). In recognition of the use of computers in management of the catalytic role that information plays in national development, Kenya developed its initial information communication (ICT) National Policy in 2003 (MOEST, 2006) the policy framework document that emphasized the need for the use computers in education management.

The Government of Kenya sees education as the natural platform for equipping the nation with computer skills in order to create dynamic and sustainable economic growth (Kenya Government, 2006). Apart from the traditional use of computers in education “as a vehicle for improving existing school curricula and school management processes”, the Kenya Government holds that the use of computer in education and training institutions will play a major role in disseminating skills to the wider society and thus create positive impacts in the economy (Kenya Government, 2006).

The use of computer in school administration has in the past received little attention as opposed to their use in teaching and learning (Hawkins and Sheingold, 2008; Olson, 2008; Taylor, 2006). Developed countries like Europe and America have made legislative provisions on the imperative use of computer in school management. A survey report by (Tomasso, 2009) on the management uses of computers in United States, Australia, Britain Mexico and 16 Netherlands reported that computer has enabled effective supervision of tasks related to the students` assessments, timetabling, administrative records, setting exams and recording exam scores.

However, before the government embraced computer in education, the development of computer based data and information management systems had already been introduced in schools such as Aga Khan and Starehe boys Centre as early as the mid 1980`s (Kavagi, 2011). Many of these institutions aimed at computerizing the administration and management functions related to the students, staff teaching. However in many rural schools such as in Seme Sub-County the importance of computer use for school administration through computer to augment school administration seems not to have caught the attention of school managers, despite the findings by (Hare, 2007, Mudhai (2007, Graca, 2005; Someketh, 2009) that the introduction of computer would be a central component leading to a transformation in schools. This belief that computer can play a key role in reforming education systems are reflected in similar agendas elsewhere in much of the industrialized world. In light of the above, the study sought to establish the use of computers in supervision of curriculum in secondary schools in Seme Sub-County, Kisumu County, Kenya.

### **1.2 Statement of the Problem:**

Computer is believed to bring about intellectual, social, cultural and economic development by creating an enabling environment. The technological advancement all over the world has placed societies on a complex automated status where information and data flow freely in websites and other electronic media. Walsch (2012) posits that technology integration could be achieved in schools only if head teachers are totally committed over a period of time, actively support it and learn as well. Head teacher who take an active approach and has positive disposition to innovation can foster an environment that has greater benefits for their students and staff.

The introduction of computer to support administration does not seem to be significant consideration when schools acquire computers. Historically the system of management in secondary schools is based on sound record keeping so that irrespective of the top management, the records form the basis for administration control and decision making at all levels. In the year 2000, computers were not only in routine administrative tasks, but also in all steps of decision making

## International Journal of Novel Research in Education and Learning

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Process, namely: problem identification, prioritizing of criteria, data organization and implementation of school plans (Fisher, 2011).

However, the knowledge on the head teachers' beliefs, attitudes, inclinations and concerns related to computer use is limited. (Jimoyiannis and Komis, 2007). The apparent neglect of computer in education supervision prompted a study on use of computer in supervision of curriculum in Seme sub-county, Kisumu County.

### 1.3 Purpose of the Study:

The purpose of the study was to explore the use of Computers in Supervision of Curriculum in Secondary Schools in Seme Sub-County, Kisumu County.

### 1.4 Objectives of the Study:

The study was guided by the following research objectives:

- i. To find out challenges facing use of computers in supervision of curriculum in secondary schools in Seme Sub-County.
- ii. To find out mitigation measures on effective use of computer in supervision of curriculum in secondary schools in Seme Sub-County.

### 1.5 Research Questions:

The study sought to answer the following research questions:

- i. What are the challenges facing use of computers in Supervision of Curriculum in Secondary Schools in Seme Sub-County?
- ii. What are the mitigation measures of effective use of Computer in Supervision of Curriculum in Secondary Schools in Seme Sub-County?

### 1.6 Scope of the Study:

This study was carried out in Seme Sub-county, Kisumu County, Kenya. It explored the use of computers in Supervision of Curriculum. It was conducted among 19 Public Secondary Schools and it targeted Principals, Teachers and Key school officials.

## 2. LITERATURE REVIEW

### 2.1 Challenges on the use of Computers in Supervision of Curriculum:

Hennessy (2010) observes that one of the greatest challenges in implementation of computer in school is balancing educational goals with economic realities. Because implementing computer requires large capital investments, schools need to be prudent in making decisions about what models of computer will be implemented and be conscious of maintaining economies of scale. Ultimately it is an issue of whether the value added by implementing computer offsets the cost, relative to the cost of alternatives. Several researchers and authors have also argued that lack of physical educational facilities, like buildings, is the major hindrance to implementation and use of computers in schools in Africa (Hennessy, 2010).

Ulf (2009) found that non-availability of software and hardware were major factors influencing utilization of computers. Kirkwood (2000) observed that if computer training is inadequate or inappropriate, the principals will not be sufficiently confident to make full use of technology. Hence lack of principals' competence and quality training can be barriers to use of computer.

Schiller (2010) noted that principals only utilized word processing software frequently to create document and slides. In another finding, Vision (2030) showed that integrating information and communication technologies in the process of infrastructure services is crucial. The government undertakes to spend 180 million Kenyan shillings in providing solar electricity to 74 public institutions. To enable them have the requisite energy for use by computer technology. Another study by Ajayi et al., (2009) on challenges facing adoption of computer in secondary schools in Ekti state Nigeria found

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that irregular power supply, low level funding to schools and non-availability of computers were the main factors affecting computer utilization in public secondary schools.

Sanya (2007) states that the biggest limitation to the use of computer technology in Kenya Public Secondary Schools system is lack of telephone facilities, interruption of connections to the computer superhighway, electricity limitation to the urban centers and poor road network making the increased cost of transporting materials unavoidable. A related study in Nandi North District in Kenya by Menjo and Boit (2005), identified lack of adequate training in computer use by teachers and administrators, and limited hardware for administrators as factors hindering computer use in school administration. This study used random sampling technique and descriptive survey design.

Odera (2008) found that lack of teacher training in use of computer technology, adequate computers facilities, software and policy on and use of computers in the teaching of traditional subjects like English, Mathematics, Biology, Chemistry, etc. contributed to non-computer use in Nyanza Province. This limited the use of computers to teaching and learning basic skills e.g. word processing and spread sheets.

According to Schiller (2010), school leaders are key factors in computer implementation in schools. They have to shoulder the heavy responsibility for creating changes in schools through the use of computers and facilitating the process of making complicated decisions to integrate it in schools (Schiller, 2010). Although the role of the principal in supporting technology integration is very important, there are a few researches conducted by Iranians on the role of the principal in computer implementation. Also, little is known about the use of computers by principals and the factors that are related to their level of computer use. This article will discuss on these issues through an analysis of data collected from Iranian secondary school principals.

A major use of computer in business decision-making is gathering data on various aspects of business performance and on the basis of those data, assessing how performance can be improved. In supervision, data on student performance is readily available in many schools and these data can be related to curricular content to assess whether required or tested curriculum is being applied. However, many educators have claimed that measuring learning through achievement tests essentially pushes schools to teach the tests, and is detrimental to a broader, more valid conception of learning (McNeil, 2005). Constructivist approaches to education argue that understanding arises as learners through prolonged engagement relate new ideas and explanations to their own prior beliefs (OECD, 2006). Standardized testing, many argue, fails to measure this understanding; hence, analysis of test data would lead to incorrect educational decisions, often pushing teachers who might be providing understanding of the material to focus on teaching test items.

According to Rogers (2006), innovation-decision process consists of five steps which are knowledge, persuasion, decision, implementation, and confirmation. These five steps usually follow each other in a time-ordered manner. Knowledge is the first stage of the successful adoption of computer technologies and it is essential for other steps in the innovation-decision process. If principals do not have enough competent in computer use, they may not adopt computer technologies into their instructional and administrative tasks (Afshari et al., 2008). Without the knowledge and skill of computer technology, principals might have a high level of uncertainty that influence their opinions and beliefs about the innovation (Rogers, 2003). In line with this idea, Felton (2006) stated that competence is a key to the use of computers by principals on a daily basis. In fact, competence in operating a computer and in utilizing software may improve the quality and efficiency of administrative performance in schools (Felton, 2006). Improved quality could lead to improve decision-making. It is clear that effective training is crucial if principals are to use computer effectively in their work (Kirkwood, 2007). If training is inadequate or inappropriate, then principals will not be sufficiently prepared, and perhaps not sufficiently confident, to make full use of technology. Hence, lack of principals' competence and lack of quality training for principals can be barriers to principals' use of computer.

In those countries and states that implement accountability systems, schools and districts are usually responsible for finding the means to improve student performance, yet have little or no capacity to do so. In some OECD countries, where there is a tradition of educational research, or collecting extensive data on education, and making these data available to researchers, there is considerable analysis of educational productivity. In the past decade, Chilean researchers, assisted by the Ministry of Education, have also begun doing extensive analysis of Chilean educational data on a regular basis using the power of computer. Yet, even in these countries, computer as a management tool has not reached into local school districts and schools. From this analysis, the most obvious policies inside education that could stimulate more use of



computer in educational management would be widespread training of secondary school and university students in using computer-based management tools and preparing high school students and education majors in college in rudimentary statistical analysis. By making such training part and parcel of a general educational preparation, the younger generation of teachers and educational administrators would be highly trainable in using data to assess their students' and their own work (OECD, 2006).

A major challenge identified in many developing countries regarding adoption and use of computer in schools is that there is no enough staff, and where there are, they are most likely IT professionals without any education experiences, skills, and/or qualifications. To effectively harness computer for school purposes requires sustained investments in supporting teachers training in order to create new learning environment (Jimoyiannis and Komis, 2007).

Teachers play a critical role in implementation and use of computer as they are at the centre of curriculum implementation and innovation at school level. However, many schools face a challenge of shortages of computer teachers and other IT professional that support adoption and use of it in classroom. Many schools continue losing well trained computer teachers to private sector which seems to pay higher salaries (GOK, 2010).

The following analysis aims to present the perceived challenges to the use of computer in supervision of curriculum which were highlighted in the reviewed studies and examine their causes and effects. The barriers are broadly divided into three categories: teacher-level barriers, i.e. those related to teachers' attitudes and approach to computers, school-level barriers, i.e. those related to the institutional context and system-level barriers, i.e. those related to the wider educational framework. Finally, individual Attitude towards the use of computer is another impediment. With specific reference to use of computer in schools, the collective viewpoint, such as whole school's culture and ethos is referenced as influential (Kozma, 2012).

The nature of the comments made is in keeping with those noted when considering change management, though more tightly and specifically focused. There is a view that aspects of individual attitude and belief are the main factors influencing a teacher's use of computer (Kaino, 2007). A key general point is the need for a teacher to be motivated to use the technology. In a study done by Heppet al, (2008), they noted that teachers must believe that use of the technology can more effectively meet learning objectives or reach a higher level goal than could otherwise have been achieved and that they must have the confidence, ability and access to necessary resources to apply the technology in their teaching situation.

Farrell and Isaacs, (2008) carried a study in Rwanda on challenges facing computer in supervision of Primary Schools in Rwanda and found out that lack of equipped computer laboratories, power connection, inadequate teacher knowledge and skill among other challenges were noted. However this study will focus on challenges to the use of computers in supervision of curriculum in Secondary Schools in Seme Sub County.

## **2.2 Mitigation measures on effective use of Computers in Supervision of Curriculum:**

According to Royer (2002), despite nearly ubiquitous access to computer technology, however, there is a significant gap between the presence of computer technology and its usage in the classroom. While in some schools computers are present in nearly every classroom in the country, they are rarely used to their fullest potential. Some of this discrepancy is due to a lack of comfort with using computers for teaching and learning. Even teachers who are using computers and report a high degree of comfort with them tend to use them in fairly rigid ways, such as searching for activities to use with students, communicating with other teachers, and word processing (Price, Cates, & Bodzin, 2002). And while students frequently do use computers in the classroom, use is often limited to information gathering and word processing rather than using multimedia tools or digital content to design and create products (Price et al., 2002). Often, learning with computers is teacher-centered rather than student-centered.

To mitigate these challenges which hinder effective use of computer in supervision of curriculum, there are quite a number of things which must be done. It is important to ensure that there is accessibility to computer infrastructure and resources. This can be made possible by the government allocating more funds to the Ministry of Education to facilitate the acquisition of the computer tools and other facilities. According to Plomp, Anderson and Law (2009), access to computer infrastructure and resources in schools is a necessary condition to the integration of computer in education. Effective adoption and integration of computer into teaching in schools depends mainly on the availability and

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accessibility of computer resources such as hardware, software, etc. Obviously, if teachers cannot access computer resources, then they will not use them. Therefore, access to computers, updated software and hardware are key elements to successful adoption and integration of technology. According to Abbott (2006), allocation of funds to buy computers and other related equipment alone cannot ensure successful implementation of the use of computer in supervision of curriculum. Abbott (2006) asserts that such implementations require hard work by all involved. This includes human resources in the form of time for planning, professional development, collaborative work, and trying new things. It also requires that teachers and administrators support each other and share a vision for the future of the school.

Various policies on computer have since been developed in Kenya. These are e-government, e-learning and teaching and computer for educational management of information systems (EMIS) (Siele, 2006). Consequently, the Kenya vision 2030 emphasized that students and teachers should be presented with opportunities to develop skills in management, word processing, spread sheets management, e-mail and internet use as well as computer integration awareness (MoE, 2005). Kenya National Examination Council (KNEC) has made the registration of Kenya Certificate of Primary Education (KCPE) and Kenya Certificate of Secondary Education (KCSE) online. Hence, school administrators are required to use internet for this service (KNEC, 2011). Though these policies have been put in place, a study on computer utilization in Kenyan schools indicated that use of computer and its related technologies are at their early stages of development. However, there is evidence of development of e-content by K.I.E (Kiptalam, 2010). A study by Menjo, and Boit (2005) in Nandi North District showed that the challenges facing the use of computer in school administration were lack of training, limited hardware and software.

A study by Yildirim (2007) found that access to technological resources is one of the effective ways to teachers' pedagogical use of computer in teaching. It has also been argued that the cost of acquiring some of the computer tools is much higher for the local schools. This can be controlled by adopting measures such as locally assembling education software as well as exploiting alternative technologies to avoid over reliance on costly imported software and hardware. Investments in custom-made digital materials with highly relevant content for Kenyan schools in rural and urban contexts are required. The Ministry of Education should take full responsibility for funding broadband internet connectivity in schools. Equally, the government should come in and subsidize computer equipments that are used in schools. The government should also consider waving import tax for computer equipment for schools.

To successfully implement computer in schools, access to good quality electricity is a primordial provision together with equipping schools with relevant infrastructures like buildings. In Kenya, the government has made commendable step by connecting over 85% of public schools with reliable electricity. This will ensure that computer related programs are rolled out and sustained to enable effective use of computer in supervision of curriculum in secondary schools. The government is further urged to expedite the connection of the remaining public schools to electricity as this will ensure uniform usage of computer in supervision across the country. Studies undertaken by Mukhongo (2008), focused on measures to mitigate challenges of implementing computer strategy at Kenya Revenue Authority, in Kenya and found out that adequate financing and skilled manpower are the main mitigation measures among others.

According to Keengwe and Onchwari (2008), the success of the use of computer in the supervision of curriculum to a great extent depends on teachers who are charged with a bigger responsibility of delivering the content. The duo assert that Teachers' attitude plays an important role as it influences the outcome of the computer programs put in place. It is believed that if teachers perceive such computer programs as neither fulfilling their needs nor their students' needs, it is likely that they will not integrate computer into their teaching and learning. If teachers' attitudes are positive towards the use of computers then they can easily provide useful insight about the adoption and integration of use of computer in the supervision of curriculum in their respective schools. It is therefore advised that in order for effective usage of computer in supervision of curriculum to be fully realized, teachers must have positive attitude towards computer programs. This can be made more possible by engaging teachers in the development of software's used in these computer programs and allowing them to equally own it as theirs besides offering extrinsic motivation. Huang & Liaw (2005) summarizes this by saying that research has shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching.

Teachers' professional development is a key factor to successful use of computer in the supervision of curriculum. Several studies have revealed that whether beginner or experienced, computer related training programs develop teachers'

competences in computer use (Bauer & Kenton, 2005; Franklin, 2007; Wozney et al., 2006). The government and other stakeholders are expected to initiate and sponsor computer training to all the teachers in both primary and secondary schools. This will enable every teacher to have the necessary skills required to facilitate the use of computer in the supervision of curriculum.

Ertmer (2005) contends that if schools hope for teachers to be fully involved in the implementation of new technologies such as computers, they need to provide supports for teacher participation. Schools may use incentives (e.g., flex time, school supplies, graduate credit, or free babysitting for teachers who stay late) to encourage participation in learning opportunities. Incentives can also take the form of praise and recognition from school administration. It is beneficial to offer support for participation even in instances where the school opts to make implementation mandatory. For some teachers, these changes may be overwhelming; a kind word or recognition of success from school leaders will go a long way in encouraging future participation.

### 3. RESEARCH METHODOLOGY

#### 3.1 Research Design:

The study used descriptive survey research design. According to Serem and Boit (2013), descriptive survey design is probably the best method for collecting original data from a population that is too large to be observed directly. The aim was to collect information from a simple data that is a representation of the population as a whole and the generalizability of the data is one of the reasons for the popularity of this approach. The main advantage of this type of design is that it enables the researchers to assess the situation within the study area at the time of the study (Kothari, 2003). The researcher therefore used the design to assess the use of computers in supervision among the secondary schools in the study area. According to Cooper (2006), a descriptive study is concerned with finding out who, what, where and how of a phenomenon which is the concern of this study.

#### 3.3 Study Area:

This study was carried out in Public Secondary Schools in Seme Sub-County in Kisumu County. Seme sub-county is one of the seven administrative sub-counties in Kisumu County. It covers an area of about 190.20 km<sup>2</sup> and has a population of 98805 as per the 2009 National Population Census (2009 Kenya National Population Census). The major economic activity in the area is agriculture with a few practicing fishing. The sub-county has 32 Public Secondary Schools (DEO, 2015). The choice of the sub-county was determined by the introduction of computer as one of the teaching subjects and the use of computer in facilitating supervision of curriculum and the familiarity of the researcher with the study area which made it easier to develop rapport with the respondents making data collection less cumbersome. According to Kisumu County (2015), Seme has seven administrative units. Seme has educational facilities comprising of 1 University, 12 youth Polytechnics, 5 Technical Training Institutes, 5 ECDE teachers training colleges, 32 Secondary Schools, 4 Special Primary Schools, and Primary Schools. In support of this, Singleton (2013) states that, the ideal setting is one that is related to the researcher's interest, easily accessible and that which allows the development of immediate rapport.

#### 3.4 Study Population:

The study populations were 19 Principals, 193 Teachers, 95 HOD's and 95 Key school officials.

#### 3.5 Sample of the study:

The study sample consisted of 19 Principals, 193 Teachers, 95 HOD's and 95 Key school officials selected through saturated sampling technique.

#### 3.6 Research Instruments:

The study employed Questionnaires, interview schedules and document analysis to elicit data from respondents.

#### 3.7 Data analysis:

Quantitative data was analyzed using descriptive statistics while qualitative data was analyzed in an ongoing process themes and sub themes of the study emerged. Statistical Package for Social Sciences (SPSS) was used as a tool to analyze the quantitative data. Descriptive statistics such as frequencies counts, percentages, mean and standard deviations were



used to describe data. Qualitative data analysis, data from the interviews was analyzed in an ongoing process as themes and sub-themes emerged from the study. According to Braun and Clarke (2006), thematic analysis is a method for identifying, analyzing and reporting patterns within data. It minimally organizes and describes data in set details. Thematic analysis is not grounded in any particular theoretical and epistemological framework and therefore can be applied across a wider range of qualitative research approaches, making it flexible (Braun and Clarke 2006). While this is an advantage, it can also be a disadvantage in that it makes developing specific guidelines for higher-phase analysis difficult and can be potentially paralyzing to the researcher trying to decide what aspects of their data to focus on (Braun and Clarke, 2006). They assert that thematic analysis seems to unearth the themes, while widely used. There is no clear agreement about what thematic analysis is and how you go about doing its (Braun and Clarke, 2006). . The analyzed data was presented in form of tables and pie-charts.

#### 4. RESULTS AND DISCUSSION OF THE STUDY

##### 4.1 Results and Discussion on Challenges of Computer use in Supervision of Curriculum in Secondary Schools:

**The first research question responded to was: What are the Challenges facing the use of Computers in Supervision of Curriculum in Secondary Schools in Seme Sub-County?**

This research question was responded to by 16 Principals, 182 teachers, 84 HODS and 83 Key school officials

When asked to give information about challenges facing use of computers in supervision of the curriculum, the HODs gave the results as presented in Table 4.1

**Table 4.1 Challenges Facing Use of Computers in Supervision**

<b>HODs challenges facing the effective use of computers in supervision</b>	<b>N</b>	<b>Mean</b>	<b>Std. deviation</b>
Insufficient number or lack of computers	84	4.21	0.601
Lack of computer knowledge and skills	84	3.88	0.863
Resistance to change	84	4.21	0.832
Availability of electricity	84	3.91	1.14
Lack of support from school management committee	84	3.64	1.23
Lack of computer resources/materials	84	4.32	1.32

The table 4.1 shows the challenges facing the effective use of computers in supervision; the following scales were rated as follows; insufficient number or lack of computers at means (4.21) which shows that majority strongly agreed with the statement, Lack of computer knowledge and skills at means (3.88) which shows that majority agreed on the statement, Resistance to change at means (4.21) which means that the participants strongly agreed on the statement, Availability of electricity at means (3.91) which shows that the participants agreed on the statements, Lack of support from school management committee at means (3.64) which shows that participants agreed on the statement and on the lack of computers resources/materials the participants strongly agreed at means (4.32).

When asked about the challenges on use of computers in supervision, one of the Principals asserted that:

*Tuna changamoto nyingi zinazokumba matumizi ya tarakilishi kama vile ukosefu wa umeme kwenye shule, wengine wetu hawana elimu ya kutosha katika matumizi yatarakilishi...kamamimisina, nawachachendiowanaujuzi ...pia wazazi na kamati ya shule hawatowi kusaidizi wa kutosha katika matumizi yatarakilishi.... eeeee, enyewe komputa zenyew ehazitoshi(This means that we have lots of challenges facing the use of computers in supervision such as lack of power and electricity in our schools, lack of computer knowledge and skills among us....like myself and few of us haveadequate skills...the parents and school management committee does not provide adequate support...and the computers are few hence inadequate),*

The study established that inadequate skills and lack of support from school management committee were some of the challenges facing utilization of computers in schools supervision, the study confirms the findings by (Kirkwood, 2000) who established that effective training is crucial if principals and HODs are to use computers effectively in their work. If training is inadequate or inappropriate, then principals will not be sufficiently prepared, and perhaps not sufficiently confident, to make full use of technology. Hence, lack of principals' competence and lack of quality training for principals can be barriers to principals' use of computers in school supervision.

**International Journal of Novel Research in Education and Learning**Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

On the issue of training as challenge on use of computers, one of the Kiswahili HODs had this to say:

*“Ukosefu wa mafunzobora ya walimu na hata walimuwakuu, huwa inachangia katika ukosefu wa Imani kwa wenye weena hii imeleta vikwazo katika matumishi yatarakilishi kwenye ukaguzi na matumizi katika shule..(This means lack of proper training for both teachers and the principals normally lead to incompetency and lack of confidence therefore it becomes a barrier to use of computers in supervision of curriculum)*

Due to inadequate training on computer use by both principals and teachers has become a challenge in use of computer on supervision of curriculum and this results to incompetency and lack of confidence that eventually influences use of computer and its more of a barrier in supervision of curriculum.

One of the Key official(Dean of Students) (DOS03) contended that:

*In fact some of us are not ready to accept and implement the change that is to use computers in supervision of curriculum, we are so resistant and this days we say that computers are meant for the digital era yet we are analogue.....hahahaha (laughs) and that's the truth. But we can be trained since computer are here with us but it's hard to train an old dog new tricks.*

From the response of the DOS03, it is evident that most of the administrators are not ready to welcome the change but have remained adamant and resistant towards the use of computers in supervision of the curriculum arguing that they are analogue yet computers are meant for the digital or young teachers and therefore are not welcoming the change. This is a challenge and a change in attitude must be embraced, this agreed with Kozma, 2012 that says individual attitude towards the use of computer is another impediment. With specific reference to use of computer in schools, the collective viewpoint, such as whole school's culture and ethos is referenced as influential. The nature of the comments made is in keeping with those noted when considering change management, though more tightly and specifically focused. There is a view that aspects of individual attitude and belief are the main factors influencing a teacher's use of computer (Kaino, 2007). A key general point is the need for a teacher to be motivated to use the technology. In a study done by Hepp et al, (2008), they noted that teachers must believe that use of the technology can more effectively meet learning objectives or reach a higher level goal than could otherwise have been achieved and that they must have the confidence, ability and access to necessary resources to apply the technology in their teaching situation.

One of the HODs (HOD 28) asserted that lack of proper and quality training is a challenge that makes them incompetent in use of computer is supervision of curriculum, here is the evidence:

*Mwalimuumejuawakatitilikuwacollege, hii mambo ya computer haikuwasana, hata hatukuwa tunafunzwa juu computer zenyewe zilikuwa chache nazi kuwa zinatumiwatu kwa ofisi, sohatahungezishika, sasa serikali imeleta ni kama ni lazima, lakini hatujapewa proper training, wakati mwingine unapata mara stima imepotea , kwa mfano ile generata tunayo hapa shuleni ni ndogo haiwezitumi wana wote stimaikienda .Juzi princy aliorganize training ya two weeks lakini vile niliona, computer inataka alot of practice na kama inawezekana kila mmoja apewe yake ndio uwena enough time, pia more trainees. Inafaa waletwe kwa mashule amawalete hawa young teachers wengi coz wao wanaelewa hii maneno na ma computer.(This means, teacher during our time in school there were few computers and we were not learning computer skills because the computers were very few and could only be used in school offices, and we could not access them but now that the government has introduced it in schools without proper training, on the other hand power shortage is also a challenge, for instance in our school there is a smaller generator that cannot serve effectively in case of power blackout. Recently the principal organized a two weeks training, though computer training requires more time for practical, if possible each person to be provided with their own computers, on the other hand more skilled young teachers to be posted to schools because they easily understand use of computers).*

It is clear that some time back there were no computers in teacher training institutions therefore the teachers who trained during that era were not exposed to skills to use computers and in case there were few that could only be used in the schools offices such as by secretaries only. However when the government introduced them they never thought more about skilful training and power supply unlike then that the teacher training institutions produces more computer skilled teachers. This agreed with a related study in Nandi North District in Kenya by Menjo and Boit (2005), identified lack of adequate training in computer use by teachers and administrators, and limited hardware for administrators as factors hindering computer use in school administration.

**International Journal of Novel Research in Education and Learning**

Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

A Key school official, Dean of Students (DOS11) confirmed that the cost of internet is relatively expensive, especially when one is downloading using the local network service providers:

*The cost of internet charges is expensive, recently we bought a modem and purchased bundles but on downloading some notes, before completing the downloading, we got a message from safaricom that your daily bundles are over, so it's a challenge because we can't keep on topping up for bundles, in fact the principal and board of management should organize for Wi-Fi connections this will enable even student to carry out research while learning even in the absence of the teacher.*

Due to expensive cost of internet connections and charges at times bare the teachers and even school key officials from accessing the internet and individuals are a times forced to rely on daily purchase of bundles that is equally expensive and therefore mostly the fail to access the internet. It is therefore necessary that both the administration and the BOM to take charge and responsibility to do the wireless internet connection in the school such use of Wi-Fi connections that serve a large population at a cheaper cost.

One of the computer teachers (TR27) responded on challenges facing use of computer in supervision in curriculum implantation by addressing on the issue of computer laboratories that are not well set and equipped:

*Huweziita room bila computer ati comp lab, hiyoniuwongomtupu, labya comp inatakikanaiwenamashinikadhaa, hapaukiangaliautapatazikochache, zinginezimeharibikahakunamwenyeantakakuzirepai, mara doo lazimaikue approved kwanza, sounapata comps zikochache, mamboya net unapatachuohaijaweka server ati tuna subscribe daily, wakatimwingine net haiku kabisa. Idadiyawanafunzipianingori, cozunapatawaqkowengikwadar, for example hapa form ones wako seventy something na comps ziko less than twenty sasawanazingangania, roompianismall, lakinisasautado? lazimawafunzwe but sasa haiku effective vile. (This means, you can't refer to a room as a computer laboratory without computers, that's a total lie. Computer laboratory must have the machines but here they are few and some are broken down and nobody is willing to repair them since it's a long process for the repair funds to be approved for release, the other challenge is on the internet server that has not been installed in schools yet daily subscription is expensive and unreliable, not forgetting on the population of students against the size of computer laboratories and the machines is un realistic, for example the form one students are seventy something against twenty computers however, they must be taught but it results to ineffectiveness in delivery.*

Most schools do not have well established computer laboratories and those with computer laboratories have very few computers that cannot effectively serve the students in this schools and this clearly goes against the use of computer in promoting effectiveness and efficiency in supervision of curriculum this agreed with several researchers and authors whom have also argued that lack of physical educational facilities, like buildings, is the major hindrance to implementation and use of computers in schools in Africa, (Hennessy, 2010).

**4.2 Results and discussion on mitigation measures on computers use in supervision of curriculum in secondary schools:**

**The second research question responded to was: What are the mitigation measures on effective use of Computers in Supervision in Secondary Schools in Seme Sub-County?**

This research question was responded to by 16 Principals, 182 teachers, 84 HODS and 83 Key School officials.

The respondents were requested to give some of the mitigation measures against challenges for computer use in secondary schools under study. Table 4.2 gives the details

**Table 4.2 Mitigation Measures for effective use of Computers in Schools**

Mitigation measures	Frequency	Percentage
Availing computer resources	306	83.8
Embrace computer use	237	64.9
Training of staff and administration personnel	329	90.1
Improvement of computer infrastructure	315	86.3
Change of attitude towards computer use	191	52.3

The following were the suggested mitigation measures for the effective use of computers in the supervision of curriculum.

**International Journal of Novel Research in Education and Learning**

Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

Resources for the use of computers should be made available in schools as was indicated by 83.8% of the respondents. Resources such as computers, telephone lines, internet, and projectors among others should be made available to promote the use of computers in the supervision of curriculum. This can be made possible by asking the government and other stakeholders to allocate funds for the purchase and installation of the necessary computer resources.

Another mitigation measure established by the study is to encourage the staff and especially those in the administration and the supervision of the curriculum (64.9%) to embrace the use of computers in the supervision of curriculum in secondary schools. This will soften the resistance arising from the staff with regards to embracing change which results from the introduction of technology.

The study also found that schools should sponsor training for staff who are directly involved in the supervision of the curriculum as indicated by overwhelming majority (91%) such as the HODs and the principals to improve on their efficiency on the use of computers in the supervision of the curriculum. This would improve their skills for the use of computers in general and specific supervisory duties.

The study further suggested that schools should lay down infrastructure for the use of computers and other related equipment in the supervision of curriculum in schools as was supported by 86.3% of the respondents sampled for the study. Through laying of computer infrastructure in schools such as internet, electricity and computers, the curriculum supervisors in such schools can find it easy to adopt the use of computers in the supervision of the curriculum. It has been reported that lack of consistent and affordable electricity is the single greatest challenge in designing a computing infrastructure for rural application. Though many schools today brag of power connectivity, such power is usually extremely unreliable or so unstable that it poses a threat to unprotected electronic equipment.

Finally, the study found as one of the mitigation measures that training on the use of computers in the supervision and delivery of curriculum should be incorporated in teacher training Colleges and Universities curriculum. This will impart the skills for the use of computers on various applications.

From the interview conducted a senior principal (SPII) had this to say:

*Most schools are now connected to electricity supply through the government policy on rural electrification. There are a number of workshops, seminars and training for school administrators on computer use organized by some Non-governmental Organizations and Educations Agencies such as KEMI. The government is efforts to introduce e-learning in primary schools is also a positive step towards computer integration. Most of the teacher training colleges now offer computer as an additional course to equip them with computer skills. With proper National ICT policy framework and provision of adequate funding, schools shall be able carry out effective supervision of curriculum implementation.*

From the response of the senior principal (SPII) disclosed that positive attitude towards use of computers by school administrators, availability of cheap computers and software, availability of mains power supply and computer training have made a number of schools to adopt computer in teaching and learning process.

One of the HODs (HOD46) responded on the same that schools still have opportunities in regard to adoption of computer in supervision of curriculum implementation and had this to say:

*We are normally called upon by the principals when there are forms to be filled for instance registration of the candidates for Kenya National Examination Council exams. This is normally done by respective class teachers and that most schools now have power supply and the newly recruited teachers have some knowledge on computer use and are able to assist the old teachers.*

It is evident that schools still have opportunities in regard to adoption of computer use in schools and there the principals and the administration at large should ensure that all that it takes to implement the use of computer in supervision of the curriculum, such as power supply and employing more skilled teachers in computer so as to assist the old teachers to gain more knowledge on computer use in supervision of the curriculum.

Yet another key school official (BOM02) asserted that:

*Resources should be made available for teachers kwashule ....kama vile komputalabs, unapata labs hazinakomputasahatawalimuhawanamotishayakuwafunzawatotonahatakutumiakomputa in record keeping ya marks...so lazima that issue iangaliwecritically tenavizurinahataserialina BOM na stakeholders wotewafanye*

## International Journal of Novel Research in Education and Learning

Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

*mambo la sivyoitakuwangumu. (This means resources to be made available for teachers in schools, computer laboratories, for instance most schools have no computers in their labs hence teachers are discouraged from teaching computer in school and even keeping progress records, and this issue has to be looked into critically and well, both the government, BOM and all stakeholders to do something or else it will remain a challenge).*

Resources should be availed to the schools, such as computer laboratories with well equipped computers so as to motivate the teachers to frequently use the computers in the supervision of the curriculum, this calls for the stakeholders to take charge and responsibility to ensure that the resources are availed this agrees with Farell and Isaacs (2008) that carried a study in Rwanda on challenges facing computer in supervision in primary schools in Rwanda and found out that lack of equipped computer laboratories, power connection, inadequate teacher knowledge and skill among other challenges were noted. From the study they further suggested that to curb the challenges various measures be taken such as computers be availed in the laboratories and frequent training of teachers to be done.

One of the Key School Official, Dean of students(DOS017) responded on the mitigation measures on compute ruse and had this to say:

*Its high time the government took the responsibility and allocate more funds towards the purchase of computer to schools, unapataserikaliwanaahidimashule that they shall supply more computers to schools, this thing of computer to schools should not be politicized, kamanikutowapesawatowepesa, naisiwachiwetu government alone, even other stakeholderswaombwe like the NGOs like recently we received 8 computers donated by PAMOJA that is an NGO, walitupea comp mpakawakatuwekea internet server, each comp piana printer yake, sahimtihanitunaprinttuhapakwashule. Infact our neighbor school managed to install the WI-FI they can now easily surf, browse and even download directly from the net. (This means, it is high time the government took the responsibility and allocate more funds towards the purchase of computer to schools, the government normally issue promises that they shall supply more computers to schools though this thing of computer to schools should not be politicized, let the funds be released, and should not be left to the government alone, even other stakeholders like the NGOs should be incorporated, like recently we received eight computers donated by PAMOJA that is an NGO, they donated computers and installed internet server, each computerhad its printer attached on it, we can now print our exams here in school .In fact our neighbor school managed to install the WI-FI they can now easily surf, browse and even download directly from the net).*

The government and stakeholders to allocate more funds for both purchase and installation of computers and other related resources to be availed in schools for instance the internet server, the Non-Governmental Organizations to be involved this agrees with a study by Yildrim (2007)that found out that access to technological resources is one of the effective ways to teachers' pedagogical use of computer in teaching. It has also been argued that the cost of acquiring some of the computer tools is much higher for the local schools. This can be controlled by adopting measures such as locally assembling education software as well as exploiting alternative technologies to avoid over reliance on costly imported software and hardware. Investments in custom-made digital materials with highly relevant content for Kenyan schools in rural and urban contexts are required. The Ministry of Education should take full responsibility for funding broadband internet connectivity in schools. Equally, the government should come in and subsidize computer equipment that are used in schools. The government should also consider waving import tax for computer equipment for schools

Yet another computer teacher (TR64) responded on mitigation measures and confirmed that:

*It's true that most of our colleagues have basic skills in computer but more staff training should be done, even if it's going to be organized locally by the school administration, it's very necessary so that more computer skills can be taught to teachers this is because in the teachers training colleges and in the university unless one is studying computer as a professional subject, your only given basic knowledge that might not be very adequate when some serious computer applications are needed, the colleges and university to organize some better computer lessons for the trainees. The teachers must also take the computer studies serious and they must change their attitude positively towards use of computers in supervision in curriculum, the administrators especially the principals and head of departments that feel they are now old should be encouraged so that they soften their resistance and adopt use of computers in their schools.*



**International Journal of Novel Research in Education and Learning**Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

Another mitigation measure is that more staff training is very necessary so as to improve their skills, he added that more to be done in the teacher training colleges and universities so that teachers to be well trained and equipped with computer skill, he further noted that teachers to be encouraged so as to develop positive attitude towards use of computers, the school administrators so soften their resistance and adopt use of computers in schools.

One of the HODs (HOD08) impeccably said that:

*Blackout is common nanishidayakamakilasiku, last week stimahaikuwa the whole week from Tuesday uptosunday, inafaatusitegemeestima, inakujanainapotea, maramingihuchomahizi machines sasalazimanjiaipatikaneya kutumiavitukama solar nagerator, ijapokuwa fuelitakuwa expensive lakinitukona back up ya power tunaezetumiastimaikipotea. {This means, blackout has become common and a daily challenge, for instance the whole of last weekfrom Tuesday to Sunday there was a blackout, so we should not only rely on electricity that at times causes breakages to our machines but can venture on other sources of power like the solar, petrol or diesel generators, though it might be expensive but they can be better power back up in case of blackout}*

The threat of power shortage or electricity blackouts should be dealt with by venturing more on other sources of power that can be used such as solar energy or better petrol or diesel generators since some of the computers are normally broken down due to unreliable power supply. To successfully implement computer in schools, access to good quality electricity is a primordial provision together with equipping schools with relevant infrastructures like buildings. In Kenya, the government has made commendable step by connecting over 80% of public schools with reliable electricity. This will ensure that computer related programs are rolled out and sustained to enable effective use of computer in supervision in secondary schools. The government is further urged to expedite the connection of the remaining public schools to electricity as this will ensure uniform use of computer in supervision of the curriculum across the country.

## **5. SUMMARY , CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY**

### **5.1 Summary of findings on challenges of computer use in supervision of curriculum:**

On the challenges of computer use in secondary education, the study found out that most of the secondary schools sampled for the study had many common challenges. The challenges varied from insufficient number or lack of computers to lack of support from the management committee. Establishing adequate number of computers in one school requires sufficient funding that cannot be met by the school only. School management and other stakeholders are expected to play a vital role of ensuring that such funds are made available.

The study also established that lack of computer knowledge and skills especially among the HODs and principals is another serious challenge. Principals and HODs are directly involved in the supervision of curriculum; their incompetence in the operation of computers has a direct negative impact on the integration of computers in the supervision of the curriculum. This incompetence is attributed to resistance to change among individuals. Failure by some HODs and principals to attend insets and other seminars meant to enhance the use of computers in the supervision of curriculum was also blamed by some respondents.

The study further found out that lack of reliable power supply is a big challenge too. Many principals indicated that frequent power interruption was making it quite difficult to operate computers. Automatic generator power standby was recommended. However, that equally calls for funds.

### **5.2 Summary of findings on mitigation measures on computer use on supervision of curriculum:**

On the mitigation measures on computer use on supervision of curriculum, the study found that if funds are allocated to schools and the use of computers in the supervision of curriculum becomes a priority, then the question of inadequacy of resources will be no more.

The study also established that the most effective way of keeping the staff especially the principals and the HODs with the ever developing new versions of software applications in the field of computer operations is to offer constant and consistent training. This will boost the confidence of the staff and eventually encourage them to fully embrace the use of computers in the supervision of curriculum.

## International Journal of Novel Research in Education and Learning

Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

The study found out that the ministry of education should introduce a computer training syllabus in both Teacher Training Colleges and Universities to equip teachers with computer knowledge. This will ensure that teachers who leave these training centers are adequately prepared and armed with both software and hardware skills that are required to operate computers

### 5.3 Conclusion of the study findings:

#### 5.3.1 Conclusion on Challenges facing Computer use:

About the challenges facing use of computers in Public Secondary Schools, the study concludes that electricity interruptions and inadequate computer training form the greatest challenges to computer utilization by secondary schools, the school administrators could have a negative attitude due to lack of competence and quality training on the use of ICT and this could interfere with their readiness to embrace computer use, Headteachers, deputy headteachers and heads of departments were not using computers for typing and printing exams, storage of schemes of work, records of work and lesson plans, preparing and computing students' academic progress but only a small percentage of them used them for supervision of curriculum implementation such as monitoring teachers' and students' classroom attendance. Schools had e-mail address and mobile phones yet a small percentage used the internet to access information on curriculum changes and requirements. This could be a reflection of the need to update the school administrators' knowledge in the world of fast moving technology of communication. Most school administrators received little or no ICT training in their formal education and therefore computer training would enhance their competence in operating a computer and in utilizing software thus improving the quality and efficiency of administration in schools.

#### 5.3.1 Conclusion on Mitigation Measures of effective use of Computers Given that there were mitigation measures for effective use of computers in secondary schools, the study concludes that the following were critical mitigation measures:

Government to allocate funds to secondary schools in form of provision of computers for use to improve the adequacy of resources. This would eventually improve the accessibility of computer resources by the staff. Sponsoring of training on computer operation among the staff members to equally mitigate the said challenges. Schools should lay down infrastructure for the use of computers in the supervision of curriculum. This would ensure that all the necessary computer resources fall into place and are always ready for use by the supervisors. This would eliminate cases of unpreparedness among the staff. Set up alternative power supply to deal with the frequent power interruption. This in a way will ensure that computers are operational all the time.

### 5.4 Recommendation of the study:

#### 5.4.1 Recommendations on challenges facing computer use In light of the finding about challenges of computers use in supervision of curriculum in secondary schools, the study recommends that:

Concerning the inadequacy of computers and other related resources, the study recommends that the government through the Ministry of Education and in partnership with other stakeholders should avail funds for the purchase of these resources to expedite the integration and smooth use of computers in supervision of curriculum. This will go a long way in achieving the vision 2030.

About lack of computer knowledge and skills, the study recommends that staff members who are computer illiterate should be offered computer training at no cost targeting specific software programs which facilitate the use of computers in supervision of curriculum. The study also recommends that computer training curriculum should be developed for teachers training colleges and Universities to arm teachers leaving these training centres with necessary skills.

Concerning resistance to change, the study recommends that the integration of computers in school management should be gradual and all members of staff should be given equal opportunities to train. This will boost their confidence and eventually create room to embrace the change.

Finally, the study recommends that alternative reliable power supply such as solar panels and automatic generators should be installed in schools to counter the frequent power interruptions from the mains.

## International Journal of Novel Research in Education and Learning

Vol. 4, Issue 5, pp: (1-18), Month: September - October 2017, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

**5.4.2 Recommendations on mitigation measures In light of the finding about mitigation measures on computers use in supervision of curriculum in secondary schools, the study recommends that:** Teachers should adequately be trained on ICTs use; schools should have an alternative source of power in case of a blackout; schools should install CCTV cameras in all appropriate areas for close monitoring of school curricula activities; schools should purchase adequate ICT facilities such as computers; schools should have strong internet connectivity devices; schools should have adequate computers that are networked for easy communication of information; schools to employ ICT skilled personnel to assist students and members of staff; schools to ensure that teacher are easily accessible to computers for use; schools should provide adequate fund for purchasing and maintaining ICT equipment in the school annual budget; schools to purchase appropriate software for use in supervision of curriculum implementation; headteachers should lead by example by having a positive attitude towards ICT use and all stakeholders should be sensitized on the importance of ICT integration in education.

### 5.5 Suggestions for Further Research:

More comprehensive studies should be undertaken to include public primary schools in order to ascertain or not whether use of ICT in supervision of curriculum implementation transcends to primary schools in order to broaden the understanding of the current problem.

The study should be replicated using other respondents such as the County and Sub-County Directors of education, Board of management of schools and high level Ministry of education officials.

Studies on the use of ICT in supervision of curriculum implementation should be carried out in Universities and other tertiary colleges so as to find out whether similar findings exist.

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**International Journal of Novel Research in Education and Learning**

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