

**EFFECT OF COMPUTERS IN MANAGEMENT OF SECONDARY
SCHOOLS IN KENYA
A CASE OF WEST POKOT COUNTY, KENYA**

SOLOMON MERIRENG

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UNIVERSITY OF NAIROBI**

2013

DECLARATION

I, Solomon Merireng, declare that this project is my original work and that it has not been presented in any other university or institution for academic credit.

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.....

SOLOMON MERIRENG

DATE

REG.NO L50/76439/2012

The research project has been submitted for examination with approval as a university Supervisor

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MR.J.KORINGURA

DATE

Department of Education, Extra-Mural Studies

University of Nairobi

DEDICATION

I dedicate this work to my children Owen Limo and Ian Kibet who have been my inspiration throughout my studies. I also dedicate this work to my friend and Brother Mr. Masika Munialo for supporting me during typing and proof reading of the project.

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ABSTRACT

The main purpose of this study was to the utilization of computers in management of secondary schools in Kenya, a case of West Pokot County, Kenya. The specific objectives of the study: to find out the factors that influence the integration in school management, to determine the role of the principal in integration of ICT in school management, to find out investigate the level of integration of ICT in school management, to establish the extent of head teachers' and teachers' accessibility to ICT resources and to find out determine the barriers to integration of ICT in school management. The survey research design will be utilized in the study. The study was guided by the systems theory as stated by Kast and Rosenzweig (1985). The theory considers the school basically as an open socio-technical system composed of five major partly overlapping and interdependent sub-systems namely managerial, structural, psychological, technical goals and values. The study employed a descriptive survey research design. The study targeted teachers and head teachers of secondary schools in the area of study. Data was collected mainly through questionnaire and interview schedule. Data was analyzed using descriptive statistical techniques, that is, the means, percentages and modes. The study established most of the principals enhanced staff training and development and mobilized resources necessary for computers and encourages staff to embrace computer. It is also implied that majority of the principals recognize and reward efforts made by staff in Computer determination. The other objective of the study was to investigate the level of determination of computer in school administration. As a result, it was established that use of computer in school management had improved the quality of information and made the school more efficient while performing its tasks. The study revealed that accessibility by the teachers to computers resources was hampered by the number of computers. From the analysis done in chapter four, it can be concluded that computers were few and the ones available lacked adequate software programmes. This therefore limited accessibility of the teachers to compute resources. There is therefore limited accessibility to Computer in schools. From the analysis done, it was revealed that barriers to determination of computer in school administration in some schools included difficulty in suing software, lack of time, lack of necessary skills and to a small extent lack of interest by the teachers. It is also revealed that to some extent that unavailability of computers hindered use of computers determination in school management. Based on the findings and conclusions of the study, the study concluded that the government should ensure accessibility of computers to all schools in the country through partnering with other educational stakeholders to ensure that ICT can aid school managers in management of schools.

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ABBREVIATION AND ACRONYMS

AKF	Aga Khan Foundation
CEPAK	Computers in Education Project in Kenya
DEB	District Education Board
GOK	Government of Kenya
H/Ts	Head teachers
ICT	Information and Community Technology
K.C.S.E	Ministry of Education
MOE	Ministry of Education science and technology
TSC	Teachers service commissions
UNESCO	United Nations Educational Scientific and Cultural Organizations

CHAPTER ONE

1.1 Background of 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, 2003). Information technology has been used in both developing county's major economic sectors such as transport. Webber (2003) 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 Information and Community Technology (ICT) has the potential of improving the efficiency and effectiveness of school manager's administrative duties (Graca, 2005; Someketh, 2001). 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 ICT and reflects on the latest development initiated by African governments to leap into information age by citing Rwanda's ambitious ICT 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 computerize their school's

management tasks mainly maintenance of payroll, financial reporting and accountings(cunninghan,1986;Bozeman et al,19991).

There is growing need to evaluate benefits of ICTs and to create opportunities for capacity building that will ensure their beneficial use and absorption within schools (Bessom 1996). He further stresses the need for African government to utilize science and technology in education sector. Marker, Wallace and Macnamara (2002) note that, recent innovations have led to cutting edge information and communication tools specifically relevant to need of school managers. Mudhai (2004) underscores the importance of ICT 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 ICT in school management.

With regard to the status of ICT in Kenyan secondary schools one of the earliest ICT projects in the education sector was implemented by the Aga Khan Foundation (AKF), which was responsible for introduction of computers in Kenya's secondary schools through the Computers in Education Project in Kenya (CEPAK) in 1983. The first phase began with the Aga Khan Academy receiving five computers and the necessary software from AKF (Makau & IDRC, 1990). The second phase introduced computers to four public secondary schools in Nairobi. During the three year period of this second

phase, the project was studied by an independent research team. This large-scale study on the use of computers in secondary schools in Kenya found that most computer-assisted lessons were observed to be in mathematics and the sciences. However, it was also found that in the majority of computer-assisted lessons teachers tended to be passive, thus leaving students to do whatever they chose. It found that some students regarded both formal and informal sessions on the computer as time for relaxation as opposed to serious learning. This approach to computer-assisted lessons was explained as being a result of the perception of the computer as an object of study; more exciting and potentially more rewarding than integration of the technology into the existing curriculum. The research also found that computer studies lessons were conducted in the computer laboratory, thus they seemed to have priority over computer-assisted lessons in other subjects. With regard to gender, female students were more disadvantaged than their male counterparts when exposure outside the school (i.e. at home or elsewhere) was considered. The proportion of males that claimed to come from a home which owned a computer was nearly twice that of females, while 21% more boys than girls claimed to have used a computer outside school. In mixed schools surveyed female students claimed to have received less in-school exposure than the males.

The overriding rationale for introducing computers in Kenya schools has either been societal rationale where students are trained to fit and operate in computer society or vocational rationale where students are to be equipped

with skills required by the computer driven job market (Kavagi, 2001). The introduction of information technology to support administration does not seem to be significant consideration when schools acquire computers. This apparent neglect of ICT in education management has led to the undertaking of this study which is focusing on factors that influence integration of ICT in schools management functions.

1.2 Statement of the problem

Education institutions in west Pokot County, like any other institution of learning in Kenya have experienced rapid computerization partly due to government and donor funding. Despite sensitization programmes and availability of computers in most schools in the district, there is minimal integration of ICT in schools management in West Pokot County.

While conducting research in Kenya on a project call SEMA on the use of Education management information system in Rift Valley where West Pokot County falls, Traxler (2007) observed that schools still provide regular statistical returns to district and provincial offices through letter posts, couriers or by telephone conversation, the author note that these methods are potentially slow, expensive and prone to errors.

Integration of ICT in school management is based on the assumption that ICT is already an integrated part of school data processing at all levels (Kituyi&Adagun, 2007). This is not the case of schools in west Pokot County as there is no effective and rapid access to information from schools giving

rise to the notion that there are incentives and barriers at work hampering integration of ICT in school management. In their research on ICT use and access to technology is one of the key elements necessary for integrating technology into school. In other words, is the technology in question available, physically accessible and purchased report card booklets while statistical returns between schools and agencies such as District Education Board (DEB), Kenya National Examination Council (KNEC), Teachers service Commission (TSC) among other are done manually making production of information slow and prone to error's Therefore, this calls for a study on factors that influence the integration of ICT in schools management in West Pokot County, Kenya.

1.3 Purpose of the Study

The main aim of this study was utilization of computers in management of secondary schools in Kenya, a case of West Pokot County, Kenya.

1.4 Objective of the study

The study was guided by the following specific objectives

- 1) To investigate the effects of ICT in enhancing management of schools finances.
- 2) To investigate the role of the principal in integration of ICT in school management
- 3) To find out investigate the level of integration of ICT in school management

- 4) To establish the extent of head teachers' and teachers' accessibility to ICT resources
- 5) To find out determine the barriers to integration of ICT in school management

1.5 Research Questions

The study was guided by the following research questions:

- 1) What are the effects of ICT in enhancing management of schools finances?
- 2) What is the role of the principal in integration of ICT in school management?
- 3) What is the level of integration of ICT in school management?
- 4) To what extend are the head teachers' and teachers' accessible to ICT resources?
- 5) What are the barriers to integration of ICT in school management?

1.6 Significance of the study

Although students have been conducted in computer technology, there is little evidence that a research in ICT integration and utilization more so on the existence of barriers and incentives in the implementation and use of ICT in school management has been done. This explains the need for the present study. The study aims at findings out factors that influence integration of ICT in school management.

It will contribute towards greater realization of the need to revolve the perennial problems inherent in slow and error prone data production in education institution. Besides, the result of the study will prove better insight on how ICT can be used to manage educational institutions. Additionally the result will give the possible challenges schools face in integrating ICT into school management which could be of interest to education agencies and stake- holders among them: District Education Board (DEB), Teachers Service commission (TSC), Kenya National Examination Council (KNEC), student's teachers and head teachers, An in-depth study generating knowledge regarding the variables determining the integration of ICT in management of secondary schools is missing in developing countries like Kenya. Education practitioners and academicians in developing countries still have little knowledge on how ICT can be effectively integrated in management of educational institutions. Therefore, the result of the study will be vital in addressing some of the gaps in knowledge in field of ICT use in school management.

The study will also be helpful to the Ministry of Education officials, education managers and system developers in developing ICT policy and masters plans. Finally, the result of this study will stimulate interest among education researchers, students, education planners and administrators for further research since very little has been done so far on ICT and education management in developing countries Kenya inclusive.

1.7 Delimitations of the Study

The study will be conducted in secondary schools in West Pokot County. It will seek to establish factors that affect integration of ICT in secondary schools management. The study will focus on aspects of school management in using ICT as administrative tool by typically looking at factors which affect the integration and utilization of ICT in school management as perceived by head teachers in secondary school in West Pokot County. This includes significance, access to resources and level of integration, ICT and knowledge of computer skills among others.

1.8 Limitations of the study

In the course of carrying out this study, the researcher encountered the following limitations. First considering the fact that there is little of previous research carried out on the factors affecting integration and utilization of ICT in secondary schools management in Kenya the scope of literature review was limited. However the researcher read more on the use of ICT in education. Second, considering the structure and bureaucratic nature of administration of many schools the researcher faced with the challenge of accessing information from respondents needed for this research. The researcher however sought clearance from all concerned authorities.

1.9 Basic Assumptions of the Study

First, like it is the case of any other new educational innovation introduced in school system in the past, it was assumed that the school personnel was facing certain problems as they try to ICT in school management (Benson, 1988). Second, it was assumed that the informants will give genuine responses about the integration of ICT in school management. Third, not all teachers' possessed the necessary competence in using computers for management functions. Others assumptions included: the principal has a role to play in integration of ICT in school management and that there are barriers to integration of ICT in school management

1.10 Theoretical frame work

The introduction of ICT is seen as a new technological innovation adapted in the management of secondary schools. The usage of ICT is an important variable in IT acceptance as it appears to be a good surrogate measure for effective deployment of IT resource in schools. The process of integrating ICT in schools administration depends on whether or not it gets embedded or built into the structure and practice of school management. The system theory first employed by Kast and Rosenzweig (1985) in the study of organizations provides useful frame work for the introduction and use of ICT in schools.

The managerial sub system include: goal setting, planning, organizing, assembling resources staffing, directing, coordinating, budgeting, evaluating,

implementing and controlling (Kast and Rosenzweig, 1985). ICT implementation in schools management provides teachers, head teachers and employees with new tools for carrying out their duties. This will present new opportunity for improving overall school administration (Balem and Gev in Barta et al, 1995).

The structural sub-systems comprise the school's organizational structure, role, working relationships and rules. ICT introduction in school would impact on the school's structures, working relationships and even roles of individuals in school, of immediate need would be recruitment of an ICT coordinator, to stimulate the implementation process within the school (Crawford, 1999).

In school the human resource, group dynamics, leadership, interpersonal relationship, communication and attitudes from the psychological sub-system (Kast and Rosenzweig, 1985). ICT integration in school management may result into a number of psychosocial issues which includes lack of capacity to cope with technological change inadequate knowledge and skills in the use of computers by teachers and head teachers and resistance to new innovation (stevene, 1982;Telem, Veen, 1995). These issues can be overcome by appropriate training programmers, effective flow of information, adequate communication and constant assurance that the existing social benefits among staff will not be disrupted by the new innovation or change Telem(1991).

Element that shape the technical sub-system include knowledge, techniques, facilities and equipment each of the elements would need to be adopted to fit into the new technological setting of the school. Some of the adjustment that needed to be made in the technologically changed school would be the creation of computer rooms for organization of computer systems, software and a data bank. The systems theory thus guided the study in linking the variables under study.

1.11 Operational Definitions of Terms

Education Management Information System (ICT): This as used refers to a planned system of collecting, processing, storing and disseminating school management data in form of information needed to carry out the function of school management

Information Communication Technology (ICT): Refers to a diverse set of technology tools and resources used to communicate, Create, disseminate, store and manage information.

Integration: refers to the capacity of using ICT to combine data processing from different data sources to present a single collection of data to the school staff.

Management: refers to the process of planning, organizing, directing and controlling activities related to school activities for the purpose of producing information desired by user

School management: Processes planning, organizing, leading and controlling school members using available human, physical, financial and information resources to achieve school objectives.

1.12 Organization of the Chapter

This chapter has covered the background to the problem, statement of the problem, purpose of the study, objectives of the study, research questions and significance of the study, scope of the study, limitation and assumption of the study, theoretical framework and definition of terms.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is review of the literature related to the study. The researcher had this drawn from research journals, dissertation and these, books, newspapers, magazines, Ministry of Education circulars, pamphlets, booklets as well as seminar papers. The researcher will carefully review these, in order to identify and evaluate the knowledge opinions, skills and attitudes of various studies and people towards the use of integrated ICT in school management.

2.2 Information Communication Technology (ICT)

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, 1990). 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 marking 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, 1990).

There have been many attempts to understand patterns of ICT adoption in schools. One such mode by, Daltone, 1989 and Dwyer, R, Ngsterff \$ Sandholtz (1991) the adoption goes through five steps or phases: Innovation, Experimental, Integration, Common use (maturation), and Sustainability. The

full potential of an educational technology will likely be misused or discarded (Rieber&Welliver, 1989). This is in agreement with Barta, Moshe and Yaffa (2002) who observed that the integration of information systems innovation would involve basically two phases, creation and development by the top management and utilization by the staff, students and outsider users. The creation phase is linked to utilization phase where learning take place; Visscher (1993) and Windham (1990) indicate that for this learning to take effects, the ICT integration process should pass through the five phases where each phase affect the other.

2.2.1 Innovation phase

This is concerned with one's initial exposure to the experience with technology. In the innovation phase there is no use of ICT in decision making at any level in educational hierarchy. It is a transition from the state of knowing that an innovation exists to the state of making a decision to adaptation (or rejection) (Keasley, 1992; and Carter, 1993). During this phase, the top management should be working in a cyclic process involving awareness and attitudinal changes of staff and large scale replication of the ICT (Windham, 1990; Carter, 1993).

2.2.2 Integration phase

Integration represents the `break through` phase. This occurs when the user consciously decides to designate certain tasks and responsibilities to the technology. Users are trained for large application of ICT through periodic

review and feedback and upgrading of the existing applications (Da Graca , 2005; Gelderma , 1998).

2.2.3 Maturation phase

This is where the use of ICT has reached a stage of widespread use and is integrated in all aspects of administration and management. Users in the maturation phase are open to technology; they are not threatened by being 'replaced' by technology. However Hall 2001 and Jameson (2002) note that there is hardly any application in education management that has reached the phase of maturity in schools administration especially in developing countries. This has to be verified in West Pokot County secondary schools.

2.2.4 Sustainability phase

In this phase the users' masters the skills required for the innovation with confidence, gaining full, intended benefits of the innovation (Lee, 2003; Land, 1999). The end result of innovation processes is the stage of mass application, leading to institutionalization process.

2.3 The Use of ICT in School Management

The use of computer in school administration has in the past received little attention as opposed to their user in teaching and learning (Hawkins & Sheingold, 1988; Olson, 1988; Taylor, 1980). Developed countries like Europe and America have made legislative provisions on the imperative use of ICT in school management. A survey report by (Tomasso, 1982) on the management uses of computers in United States, Australia, Britain Mexico and

Netherlands reported that ICT 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 ICT developmental success in USA is adoption of an ICT policy and the existence of an ICT 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, 1998). Although developing countries have become aware of the invaluable use of ICT 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 imitative it was found that ICT policy plan has been evolved, but have not been fully integrated in administration and management of school system (Zain, et al 2004). In sub Saharan Africa, countries such as South Africa and Botswana have gone a long way in adopting an exemplary approach to integration of ICT in school systems (Kituyi an Adagun, 2008). In recognition of IICT in management of the catalytic role that information plays in national development, Kenya developed its initial info formation communication (ICT) National Policy in 2003 (MOEST, 2006) the policy framework document that emphasized the need for national ICT policy and the need to embrace ICT in education management.

The ICT policy document puts emphasis on two earlier acts, which are quite relevant to the current project. One is the telecommunication Act (1997) whose main objective was to increase the penetration and level of communication services in the country through private sector investment rather than government intervention. The other is the rural communication development policy (2001) known as the digital villages which was aimed at providing access to basic communication services within reasonable distance to all people in Kenya (Wanjiru,2008).

However, before the government embraced ICT in education, the development of computer based data and information management systems had already been introduced in schools such as Aga khan and sterehe boys center as early as the mid 1980`s (Kavagi,2001). Many of these institutions aimed at computerizing the administration and management functions related to the students, staff and financial records. In conclusion, the review of the research literature indicate that ICT integration in school administration and management systems continues to be difficult and requires Mach more time. While increasingly, projects tend to give more attention on human resource development, much of this effort is spent on strengthening technical skills to use computer for teaching and learning. Perhaps the neglect of the importance of computer use for school administration through ICT to augment school administration seems unjustified (Visscher, 1991;Sainko

Shehtin,1999;Smeets et al,1999). It is hoped that this study will identify factors influencing the integration of ICT in school management.

The introduction of ICT would be a central component leading to a transformation in schools. This belief that ICT can play a key role in reforming education systems is reflected in similar agendas elsewhere in much of the industrialized world (e.g., DFEE,UK, 1997; MOE, Singapore, 2000; DE, Victoria, 1998; MOE, Research, and Church Affairs, Norway, 2000). These reform agendas are all concerned with the adoption and use of ICT in schools to increase learning opportunities and student motivation and achievement. These policies state that the introduction of ICT into educational environments will accelerate change and ultimately improve student learning. In fact, ICT reforms require consideration of issues such as budgeting, staffing, resourcing and training; these are not uncommon considerations for other reforms. In addition, consideration of other issues such as building and managing infrastructures, networks, intranets, boards, managing large amounts of information, developing skills and strategies to support the creation of knowledge and utilization of ICTs, keeping up with the new technology and the related terminology are necessary. These can all be addressed in educational settings by building ICT capacities. In conjunction with building ICT capacity, there is a need to devise strategies to deal with resistance to change, coping with continuous change, and providing support

structures in change rich environments in order to sustain reforms. These aspects can be addressed in educational settings by building change capacities.

Moreover, exploring leadership structures that compliment transformative ICT integration will also be valuable. Redefining roles and expectations, and exploring options for relevant ongoing professional development for leaders are all aspects that can be addressed in the building of Leadership Capacity. In fact, educational leader have a major responsibility for initiating and implementing school change through the use of information and communication technology and can facilitate complex decision to integrate it into learning, teaching and school administration (Schiller, 2003).So, this article will show that school leaders can have a significant impact on the integration of ICT into pedagogical practice and, in turn, on student learning.

2.4 Determinant Factor for Integration of ICT in School Management

Despite the huge investment in computer system acquisition in educational institution, data processing technologies are not widely used (Traxler, 2007; Fitzgerald, 2003). Empirical research on low usage and knowledge on variables determining the success of ICT technology in school administration is largely taking. There is little knowledge about what mechanisms are effective and which factor influence ICT process integration. Failure to address these factor lead to wasted investments and failed process. Likely relevant factors being identified are discussed here.

2.4.1 Knowledge on the need for Education Management Information System

Many information technological innovations in education institution are attempted without a careful examination of whether or not they address what perceived to be priority needs. An assessment of the information need of a school is of immense importance in the automation process. Several studies in the United States, United Kingdom and Australia confirm the importance of relating need to decisions about innovations. In the experimental school project of new South Wales automated and school information system (OASIS), HongKong`s school automated system (HICSITS), Netherlands school information system (SCHOLIS) and Briten`s local management of school initiative (LMSI). (Vischer\$Spuck, 1991, Yee,2000) found out that the degree to which there was formal recognition within the school system on unmet needs was an important determinant associated with integration of the program. In the Kenya context an assessment of the administrative need of secondary schools before integrating ICT into main stream school administration is imperative in order to militate against failure. When the automation goals for computer introduction and use have been agreed upon and formulated by the school. The school head, teachers and other stake holders should be involved in providing their roles, duties and information requirement for the school computerization. Mbithi (1974) pointed out that the major administrative task in Kenyan schools include examination records, handing over /taking over, the log book, schemes of work, students` admission

records, staff attendance, teacher`s records of work, financial transactions, stores records, master timetable, school minutes, school correspondences, discipline masters and records of school property.

2.4.2 Stakeholders` participation

Introduction of an innovation must fully involve the users in the entire implementation program (Fullan, 1992; Visscher, 1988). Users fail to utilize IT because their need and desires were ignored during the design stage and hence feel no sense of ownership. (Mumford, 1980) stresses the importance of user involvement to the success of IT integration in school administration. This avoids teachers viewing it as an intrusion being forced on them from outside their working environment and a challenge to their profession autonomy. (Loveless, 1996). Peled and Alexander 1989 observe that the first condition for an innovation to become part of school culture is to involve teachers and head teachers who should consider themselves partners and not participants in the program.

2.4.3 Attitude

Individual teacher initiative accounts for much of the implementation of computer technology in schools; attitude is a strong mediator for motivational variables to predict behavioral intention of computer technology use (Taylor & Todd, 1995). Lack of support by stakeholders can be significant barrier towards implementation of computers in school administration (Murton 1997; Brand, 1998). On his review of literature on teachers attitudes towards

computers, the impact of computer use and the impact of personal and learning environment characteristics affecting a teacher's intention to use computers as a tool for administration. Kazlauskis and Koop (1995), in their examination of the barriers to the implementation of computers, observes critical factor that all staff need to recognize and understand that integrating computers in school administration is complex innovation which requires change to the whole school's practice and culture, and the teachers attitude and management practice. Such change is achieved incrementally over a long period of time.

2.4.4 Office computing service

Computer technology use depends on whether there are enough computers. Access to computers at both workplace and home influence an individual whether to use the technology or not. Gelderman, (1998) draws conclusion about the number of years of experience with computers teachers have and the impact it makes on implementation process.

2.4.5 Perceived ease of use

This is the users' perception of the amount of effort needed to use the system it is measured in terms of how clear and understandable the integration with the system, and ease of use of the system (Davies, 1989). Technology acceptance model (TAM) studies have shown that perceived ease of use is a determinant of usage (Davies, 1989; Adams et al, 1992).

2.4.6 Perceived importance

This is the users' perception of the degree to which using the system will improve his/her performance in the work place. Attitude influence the implementation of computers in schools (Fullan, 1992). Head teachers and teachers become attached to the way they carry out their tasks and this could lead to resistance to computerization in administration (Telem, 1991; Vischer, 1991). The introduction and use of computers in schools has to be accompanied by measures that ensure that any hindrance to IT implementation occasioned by attitudes is reduced to the minimum. Through motivation, using a number of ways which include involving them in the entire IT implementation program, training, internal support and creation of school organizational climate that is conducive to change. Motivation of users before, during and after the implementation of IT integration is very vital to its success and its absence leads to dysfunction behavior (Benneet and Lancaster, 1986).

2.5 Role of the principal in integration of ICT in school management

In schools, the teachers should provide behavioral changes in the students. The teachers are expected to integrate their lessons with ICT in order to train the individuals of an information society. A number of studies were conducted to explore the relationship between ICT and the teacher (Moseley et al. 1999; Salamon 2000; McCannon & Crews2000; Morales et.al. 2000; Fluck 2001; Zhao & Cziko, 2001; Granger et.al. 2002; Ainleyet. al. 2002; Demetriadis

et.al. 2003; Lin et.al. 2004; Ruthven et.al. 2004; Mooij, 2004).The findings of these studies revealed that although schools are focusing on ICT, the emphasis has often been on providing resources and not the pedagogies that will ensure the survival of the reform over the long term.

In relation to the implementation of ICT, not only staffs need operate them, but also they must have an understanding of the pedagogy required to use them and to meet teaching and learning needs (Tearle 2004).According to Fullan (1998), successfully implemented reforms require leaders to participate as active learners in dynamic changing environments. Hence, educational leaders can have a major impact on the success, coherence and sustainability of the change process. They must manage issues related to technology and the educational community (Jacobsen & Hunter, 2002).In a study of 18 schools in Hong Kong which introduced ICT across the curriculum, the way the technology was used, its impact on learning and teaching, “bore no relationship with the technology infrastructure or technical skills level of the teachers. Instead, it was very much determined by the vision and understanding of the school principal and the prevalent school culture” (Pelgrum & Law, 2003,). Leading change is therefore a key challenge for principals to face as the key agents of change.

Yuen (2000) categorized schools which enthusiastically adopted ICT into teaching and learning into three predominant models of technology adoption.

The models differed according to particular critical characteristics shown in the integration process: he named them 'technological adoption'; 'catalytic integration' and 'cultural integration' models. In the 'technological adoption' model school, the principal and the majority of staff viewed ICT as a tool to improve existing teaching practices, and increase efficiencies and student IT skills. The key obstacles to implementation in these schools are gaining the right hardware and software technology and developing the right infrastructure and curriculum resource materials. Yuen noted that in these schools, the impact of technology on teaching and student practices was minimal.

The technology just confirmed existing presentations, predominantly through PowerPoint. (Lam & Lee, 2000) Schools that were characterized as 'catalytic integration' tended to have 'visionary leadership' and a history of continuous educational reform through engaging teachers in a learning process. In these schools, teachers are seen as members of a 'learning organization' (Senge, et al., 2000). Principals in these schools view ICT as an opportunity to affect change through educational reform. ICT use was deliberate and designed as an integral part of the curriculum, consistent with the school ethos. The key focus in these schools was teacher development with strong support for curriculum leadership and development. These schools showed more student centered work, more innovative teacher practices, and were more likely to adopt

innovative pedagogical practices such as collaborative problem-based learning tasks and projects.

The school principal is the key agent of change, who has a clear vision and implementation strategy for ICT with the main elements being staff development focusing on curriculum tailoring and pedagogic innovation. In these schools, ICT helped advance curriculum reform initiatives already underway. The challenges for teacher in 'catalytic integration' schools are to rethink their attitudes, beliefs and understandings held about their roles as educators and to re-conceptualize their understanding of schooling and society. The 'cultural integration' model schools (Law, 2000) had a strong and distinctive school culture and a long history of supporting student-led initiatives. These schools had long established support for student-initiated work that aligned with the school ethos of self-actualization and lifelong learning. ICT in these schools was perceived mainly as an opportunity to provide a very powerful tool to support the empowerment of students and teachers.

These schools had a long history of supporting individual choices. The teachers and students were not required to learn technical skills to use ICT. Rather, ICT adoption was encouraged through existing channels across the schools. In these schools, a wide range of ICT adoption was found from expository teacher-centered teaching to more student-centered social

constructivist and collaboration work as well as using ICT as a cognitive tool. In fact in these schools rather than the school staff leading technical training, it was the student organizations that ran courses for fellow students to improve their ICT literacy skills. Schools adopting the cultural integration model used ICT to help promote the school vision and mission, though in many different ways. The differences lie in the different educational values and emphasis that are deeply rooted in the rich tradition and history of the schools in the study.

Schools without such established traditions and culture would find it extremely difficult to integrate ICT into the curriculum in the same way that these schools do. On the other hand, DEST (2002) categorized schools according to their levels of ICT integration. They are as follows: Type A: Encouraging the acquisition of ICT skills as an end themselves; Type B: Using ICTs to enhance students' abilities within the existing curriculum; Type C: Introducing ICTs as an integral component of broader curricular reforms that are changing not only how learning occurs but what is learned; Type D: Introducing ICTs as an integral component of the reforms that alter the organization and structure of schooling itself. Many learning communities have accepted ICT at Type A or Type B level. Integration of ICTs at these levels has very little impact on curriculum frameworks and pedagogies. Type C and Type D level of integration differs in that it challenges learning communities at all levels to initiate and sustain reforms that not only modify

but create new understandings, policies, structures and pedagogies that enable the potential of ICTs to be fully utilized.

Emerging information technologies enable a shift from the transfer and assimilation of information to the creation, sharing, and mastery of knowledge (Dede, 1999). The implications for learning and teaching at this level need to be clarified and the values and beliefs that underpin educational practices need to be explored and challenged. This shift in thinking and approach may further contribute to the alignment of learning and teaching pedagogies so that the needs of learning communities can more adequately be addressed and catered for. Educational leaders need to acknowledge that in a dynamic climate training is essential if the change is to remain sustainable. Continuous learning at all levels within the community is important to help deal with the demands of evolving change (NCSL, 2001). Therefore, professional development programs that target the needs of the school community are essential if ICTs are to have a meaningful impact on learning (OECD, 2001). Educational leaders are under increasing pressure to react to and manage issues related to technology and the educational community (Jacobsen & Hunter, 2002). They will spearhead the processes of identifying the changes that are needed in their local contexts, engaging their respective communities in the change process and carrying through the adjustments that are needed (DETYA, 2001). Thus, school leaders play an important role in establishing technology as a part of school culture (Anderson & Dexter, 2000).

In fact, leadership and ICT integration are multifaceted, complex processes that often require the questioning of practices and beliefs, the building of capacities and support networks that will assist the learning community make the transition to Type C and D (DEST, 2001) ICT integration. Educational leaders have to make decisions about both professional development opportunities for teachers and the acquisition of technology resources (Jacobson & Hunter 2003). Support for educational leaders is required to help ensure the success of ICT integration at Level C &D and the progress of school cultures in which expectations are clearly defined, and a commitment to change is made. Hence, the successful adoption of ICT to improve student learning requires effective leadership and planning (MCEETYA, 2005). Leaders need to be aware and capable of addressing associated issues competently and confidently. In response to this question why some schools were more successful than others at implementing ICT.

2.6 Barriers to Integration of ICT into Education

The act of integrating ICT into teaching and learning is a complex process and one that may encounter a number of difficulties. These difficulties are known as "barriers" (Schoepp, 2005). A barrier is defined as "any condition that makes it difficult to make progress or to achieve an objective" (WordNet, 1997, as cited in Schoepp, 2005). The objective being analyzed in this paper is successful ICT integration in science education.

Classification of the barriers: Different categories have been used by researchers and educators to classify barriers to teacher use of ICT in science classrooms.

Several studies have divided the barriers into two categories: extrinsic and intrinsic barriers. However, what they meant by extrinsic and intrinsic differed. In one study, Ertmer (1999) referred to extrinsic barriers as first-order and cited access, time, support, resources and training and intrinsic barriers as second-order and cited attitudes, beliefs, practices and resistance; whereas, Hendren (2000, as cited in Al-Alwani, 2005) saw extrinsic barriers as pertaining to organizations rather than individuals and intrinsic barriers as pertaining to teachers, administrators, and individuals.

Another classification found in the literature is teacher-level barriers versus school-level barriers. Becta (2004) grouped the barriers according to whether they relate to the individual (teacher-level barriers), such as lack of time, lack of confidence, and resistance to change, or to the institution (school-level barriers), such as lack of effective training in solving technical problems and lack of access to resources. Similarly, Balanskat et al. (2006) divided them into micro level barriers, including those related to teachers' attitudes and approach to ICT, and macro level barriers, including those related to the institutional context. The latter added a third category called macro level

(system-level barriers), including those related to the wider educational framework.

Another perspective presents the obstacles as pertaining to two kinds of conditions: material and non-material (Pelgrum, 2001). The material conditions may be the insufficient number of computers or copies of software. The non-material obstacles include teachers' insufficient ICT knowledge and skills, the difficulty of integrating ICT in instruction, and insufficient teacher time.

Some of these studies look at the barriers at teacher, institution, or system level. However, since the purpose of this paper is to determine the present and future barriers that face science teachers in their schools, this analysis focuses on the teacher-level and school-level barriers only as discussed in the following sections.

2.6.1 Teacher-level barriers

Lack of teacher confidence: Several researchers indicate that one barrier that prevents teachers from using ICT in their teaching is lack of confidence. Dawes (2001) sees this as a contextual factor which can act as a barrier. According to Becta (2004), much of the research proposes that that this is a major barrier to the uptake of ICT by teachers in the classroom. In Becta's survey of practitioners (2004), the issue of lack of confidence was the area that attracted most responses from those that took part.

Some studies have investigated the reasons for teachers' lack of confidence with the use of ICT. For example, Beggs (2000) asserted that teachers' "fear of failure" caused a lack of confidence. On the other hand, Balanskat et al. (2006) found that limitations in teachers' ICT knowledge makes them feel anxious about using ICT in the classroom and thus not confident to use it in their teaching. Similarly, Becta (2004) concluded their study with the statement: "many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of children who perhaps know more than they do" (p. 7). In Becta's survey (2004), many of the teacher respondents who identified their lack of confidence as a barrier reported being particularly afraid of entering the classroom with limited knowledge in the area of ICT with their students knowing that this was the case. It was argued that lack of confidence and experience with technology influence teachers' motivation to use ICT in the classroom (Cox, Preston, and Cox, 1999b; Osborne & Hennessy, 2003; Balanskat et al., 2006).

On the other hand, teachers who confidently use technologies in their classrooms understand the usefulness of ICT. Cox, Preston, and Cox (1999) found that teachers who have confidence in using ICT identify that technologies are helpful in their teaching and personal work and they need to extend their use further in the future.

Lack of teacher competence: Another barrier, which is directly related to teacher confidence, is teachers' competence in integrating ICT into pedagogical practice (Becta, 2004). In Australian research, Newhouse (2002) found that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices.

Current research has shown that the level of this barrier differs from country to country. In the developing countries, research reported that teachers' lack of technological competence is a main barrier to their acceptance and adoption of ICT (Pelgrum, 2001; Al-Oteawi, 2002). In Syria, for example, teachers' lack of technological competence has been cited as the main barrier (Albirini, 2006). Likewise, in Saudi Arabia, a lack of ICT skills is a serious obstacle to the integration of technologies into science education (Al-Alwani, 2005; Almohaissin, 2006). Empirica (2006) produced a report on the use of ICT in European schools. The data used for the report came from the Head Teachers and Classroom Teachers Survey carried out in 27 European countries. The findings show that teachers who do not use computers in classrooms claim that "lack of skills" are a constraining factor preventing teachers from using ICT for teaching. Another worldwide survey conducted by Pelgrum (2001), of nationally representative samples of schools from 26 countries, found that teachers' lack of knowledge and skills is a serious obstacle to using ICT in primary and secondary schools. The results of a study conducted by Balanskat

et al. (2006) have shown that "in Denmark ... many teachers still chose not to use ICT and media in teaching situations because of their lack of ICT skills rather than for pedagogical/didactics reasons" while "in the Netherlands ... teachers' ICT knowledge and skills is [sic] not regarded any more as the main barrier to ICT use. Hence, lack of teacher competence may be one of the strong barriers to the integration of technologies into education. It may also be one of the factors involved in resistance to change.

Resistance to change & negative attitudes: Much research into the barriers to the integration of ICT into education found that teachers' attitudes and an inherent resistance to change were a significant barrier (Cox et al., 1999a; Watson, 1999; Earle, 2002; Becta, 2004; Gomes, 2005; Schoepp, 2005). From his/her analysis of the questionnaires, Gomes (2005) found that science teachers' resistance to change concerning the use of new strategies is an obstacle to ICT integration in science teaching. At a broader level, Becta (2004) argued that resistance to change is an important barrier to teachers' use of new technologies in education.

Watson, an Australian researcher, (1999) argued that integrating the new technologies into educational settings requires change and different teachers will handle this change differently. According to him, considering different teachers' attitudes to change is important because teachers' beliefs influence what they do in classrooms. Becta (2004) claims that one key area of teachers'

attitudes towards the use of technologies is their understanding of how these technologies will benefit their teaching and their students' learning. Schoepp's study (2005) found that, although teachers felt that there was more than enough technology available, they did not believe that they were being supported, guided, or rewarded in the integration of technology into their teaching. According to Empirica (2006), teachers who are not using new technology such as computers in the classroom are still of the opinion that the use of ICT has no benefits or unclear benefits.

Resistance to change seems not to be a barrier itself; instead, it is an indication that something is wrong. In other words, there are reasons why resistance to change occurs. According to Earle (2002), the change from a present level to a desired level of performance is facilitated by driving (encouraging) forces such as the power of new developments, rapid availability, creativity, Internet access, or ease of communication, while it is delayed by resisting (discouraging) forces such as lack of technical support, teacher expertise, or time for planning. In their study, Cox et al. (1999a) found that teachers are unlikely to use new technologies in their teaching if they see no need to change their professional practice. They showed that teachers who resist change are not rejecting the need for change but lack the necessary education in accepting the changes and are given insufficient long-term opportunities to make sense of the new technologies for themselves.

Obviously, not all communities have this barrier. In Europe, for example, Korte and Husing (2007) state that only very few teachers can be regarded as fundamentally opposing the use of ICT in the classroom. Only a fifth of European teachers believe that using computers in class does not have significant learning benefits for pupils (Korte & Husing, 2007).

2.6.2 School-level barriers

Lack of time: Several recent studies indicate that many teachers have competence and confidence in using computers in the classroom, but they still make little use of technologies because they do not have enough time. A significant number of researchers identified time limitations and the difficulty in scheduling enough computer time for classes as a barrier to teachers' use of ICT in their teaching (Al-Alwani, 2005; Becta, 2004; Beggs, 2000; Schoepp, 2005; Sicilia, 2005). According to Sicilia (X005), the most common challenge reported by all the teachers was the lack of time they had to plan technology lessons, explore the different Internet sites, or look at various aspects of educational software.

Becta's study (2004) found that the problem of lack of time exists for teachers in many aspects of their work as it affects their ability to complete tasks, with some of the participant teachers specifically stating which aspects of ICT require more time. These include the time needed to locate Internet advice, prepare lessons, explore and practise using the technology, deal with technical problems, and receive adequate training.

Recent studies show that lack of time is an important factor affecting the application of new technologies in science education (Al-Alwani, 2005). According to Al-Alwani (2005), lack of time is a barrier affecting the application of ICT in Saudi Arabia because of busy schedules. He indicated that because Saudi teachers work from about 7.00 a.m. until 2.00 p.m. and the average number of class sessions taught by science teachers is 18 per week, both teachers and students have a limited number of hours during the day to work on integrating ICT into science education. Similarly, in Canada, Sicilia (2005) concluded that teachers take much more time to design projects that include the use of new ICT than to prepare traditional lessons. Teachers interviewed by Sicilia (2005) commented that "the constraints of different class schedule [sic] contributed to the lack of time they spent together to work on planning classroom activities". Supporting this finding, the most significant constraint on use quoted by 86-88% of primary and secondary science teachers surveyed by Dillon, Osborne, Fairbrother, and Kurina (2000) was lack of time (as cited in Osborne & Hennessy, 2003). Gomes (2005) concluded that one of the main reasons that science teachers do not use ICT in the classroom is lack of the time necessary to accomplish plans.

Lack of effective training: The barrier most frequently referred to in the literature is lack of effective training (Albirini, 2006; Balanskat et al., 2006; Beggs, 2000; Ozden, 2007; Schoepp, 2005; Sicilia, 2005; Toprakci, 2006). One finding of Pelgrum's (2001) study was that there were not enough

training opportunities for teachers in the use of ICTs in a classroom environment. Similarly, Beggs (2000) found that one of the top three barriers to teachers' use of ICT in teaching students was the lack of training. Recent research in Turkey found that the main problem with the implementation of new ICT in science was the insufficient amount of in-service training programs for science teachers (Ozden, 2007), and Toprakci (2006) concluded that limited teacher training in the use of ICT in Turkish schools is an obstacle.

According to Becta (2004), the issue of training is certainly complex because it is important to consider several components to ensure the effectiveness of the training. These were time for training, pedagogical training, skills training, and an ICT use in initial teacher training. Correspondingly, recent research by Gomes (2005) relating to science education concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom, and lack of training concerning the use of technologies in science specific areas were obstacles to using new technologies in classroom practice. Some of the Saudi Arabian studies reported similar reasons for failures in using educational technologies: the weakness of teacher training in the use of computers, the use of a "deliver)" teaching style instead of investment in modern technology (Alhamd, Alotaibi, Motwaly, & Zyadah, 2004), as well as the shortage of teachers who are qualified to use the technology confidently (Sager, 2002).

Providing pedagogical training for teachers, rather than simply training them to use ICT tools, is an important issue (Becta, 2004). Cox et al. (1999a) argue that if teachers are to be convinced of the value of using ICT in their teaching, their training should focus on the pedagogical issues. The results of the research by Cox et al. (1999a) showed that after teachers had attended professional development courses in ICT they still did not know how to use ICT in their classrooms; instead they just knew how to run a computer and set up a printer. They explained that this is because the courses only focused on teachers acquiring basic ICT skills and did not often teach teachers how to develop the pedagogical aspects of ICT. In line with the research by Cox et al. (1999a), Balanskat et al. (2006) indicated that inappropriate teacher training is not helping teachers to use ICT in their classrooms and in preparing lessons. They assert that this is because training programmes do not focus on teachers' pedagogical practices in relation to ICT but on the development of ICT skills.

However, beside the need for pedagogical training, according to Becta (2004), it is still necessary to train teachers in specific ICT skills. Schoepp (2005) claims that when new technologies need to be integrated in the classroom, teachers have to be trained in the use of these particular ICTs. According to Newhouse (2002), some initial training is needed for teachers to develop appropriate skills, knowledge, and attitudes regarding the effective use of computers to support learning by their students. He argued that this also

requires continuing provision of professional development to maintain appropriate skills and knowledge.

Fundamentally, when there are new tools and approaches to teaching, teacher training is essential (Osborne & Hennessy, 2003) if they are to integrate these into their teaching. However, according to Balanskat et al. (2006), inadequate or appropriate training leads to teachers being neither sufficiently prepared nor sufficiently confident to carry out full integration of ICT in the classroom. Newhouse (2002) states that "teachers need to not only be computer literate but they also need to develop skills in integrating computer use into their teaching/learning programmes.

According to Newhouse (2002), teachers need training in technology education (focusing on the study of technologies themselves) and educational technology (support for teaching in the classroom). Similarly, Sicilia (2005) found that teachers want to learn how to use new technologies in their classrooms but the lack of opportunities for professional development obstructed them from integrating technology in certain subjects such as science or maths. Other problematic issues related to professional development in ICT are that training courses are not differentiated to meet the specific learning needs of teachers and the sessions are not regularly updated (Balanskat et al. 2006).

Pre-service teacher education can also play a significant role in providing opportunities for experimentation with ICT before using it in classroom teaching (Albirini, 2006). Lack of on ICT focus in initial teacher education is a barrier to teachers' use of what is available in the classroom during teaching practice (Becta, 2004). Where training is ineffective, teachers may not be able access to ICT resources.

Lack of accessibility: Several research studies indicate that lack of access to resources, including home access, is another complex barrier that discourages teachers from integrating new technologies into education and particularly into science education as the following discussion illustrates.

The various research studies indicated several reasons for the lack of access to technologies occurred. In Sicilia's study (2005), teachers complained about how difficult it was to always have access to computers. The author gave reasons like "computers had to be booked in advance and the teachers would forget to do so, or they could not book them for several periods in a row when they wanted to work on several projects with the students" (p. 50). In other words, a teacher would have no access to ICT materials because most of these were shared with other teachers. According to Becta (2004), the inaccessibility of ICT resources is not always merely due to the non-availability of the hardware and software or other ICT materials within the school. It may be the result of one of a number of factors such as poor

organization of resources, poor quality hardware, inappropriate software, or lack of personal access for teachers (Becta, 2004).

The barriers related to the accessibility of new technologies for teachers are widespread and differ from country to country. Empirica's (2006) European study found that lack of access is the largest barrier and that different barriers to using ICT in teaching were reported by teachers, for example a lack of computers and a lack of adequate material. Similarly, Korte and Husing (2007, p.4) found that in European schools there are some infrastructure barriers such as broadband access not yet being available. They concluded that one third of European schools still do not have broadband Internet access. Pelgrum (2001) explored practitioners' views from 26 countries on what were the main obstacles to the implementation of ICT in schools. He concluded that four of the top ten barriers were related to the accessibility of ICT. These barriers were insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient simultaneous Internet access. Toprakci (2006) found that low numbers of computers, oldness or slowness of ICT systems, and scarcity of educational software in the school were barriers to the successful implementation of ICT into science education in Turkish schools. Similarly, Al-Alwani (2005) found that having no access to the Internet during the school day and lack of hardware were impeding technology integration in Saudi schools. Recent research on Syrian

schools indicated that insufficient computer resources were one of the greatest impediments to technology integration in the classroom (Albirini, 2006).

Basically, there are several barriers associated with the lack of access to ICT. In his research, Gomes (2005) found a lack of appropriate infrastructure and a lack of appropriate material resources to be barriers. However, overcoming such hardware barriers does not, in itself, ensure ICT will be used successfully. According to Balanskat et al. (2006), the accessibility of ICT resources does not guarantee its successful implementation in teaching, and this is not merely because of the lack of ICT infrastructure but also because of other barriers such as lack of high quality hardware, suitable educational software, and access to ICT resources.

Newhouse (2002) asserts that poor choices of hardware and software and a lack of consideration of what is suitable for classroom teaching are problems facing many teachers. Similarly, Cox et al. (1999) found that the majority of teachers agreed that insufficient ICT resources in the school and insufficient time to review software prevent teachers using ICT. According to Osborne and Hennessy (2003), the limitations on access to hardware and software resources influenced teachers' motivation to use ICT in the classroom.

Lack of technical support: Without both good technical support in the classroom and whole-school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT (Lewis, 2003).

Pelgrum (2001) found that in the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance.

In Sicilia's study (2005), technical problems were found to be a major barrier for teachers. These technical barriers included waiting for websites to open, failing to connect to the Internet, printers not printing, malfunctioning computers, and teachers having to work on old computers. "Technical barriers impeded the smooth delivery of the lesson or the natural flow of the classroom activity" (Sicilia, 2005).

Korte and Husing (2007) argued that ICT support or maintenance contracts in schools help teachers to use ICT in teaching without losing time through having to fix software and hardware problems. The Becta (2004) report stated that "if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns" (p. 16). Many of the respondents to Becta's survey (2004) indicated that technical faults might discourage them from using ICT in their teaching because of the fear of equipment breaking down during a lesson.

In science teaching, several studies indicated that lack of technical support is a main barrier to using technologies. According to Gomes (2005), ICT integration in science teaching needs a technician and if one is not available the lack of technical support can be an obstacle. In Turkey, Toprakci (2006)

found that the lack of technical support was one of two significant barriers to the integration of ICT into science education in schools and might be considered "serious". In Saudi Arabia, science teachers would agree to introduce computers into science teaching, except that they believe they will encounter problems such as technical service or hardware problems (Almohaissin, 2006). Sicilia (2005) argued that whatever kind of technical support and access teaching staff have and whether they have twenty years of experience or are novices to the profession, technical problems generate barriers to the smooth delivery of science lessons by teachers.

Although lack of technical support can prevent teachers from successfully integrating ICT into education, recent research indicates that in some countries (such as the United Kingdom, the Netherlands, Latvia, Malta and the Czech Republic), schools have recognised the importance of technical support to assist teachers to use ICT in the classroom (Korte and Husing, 2007).

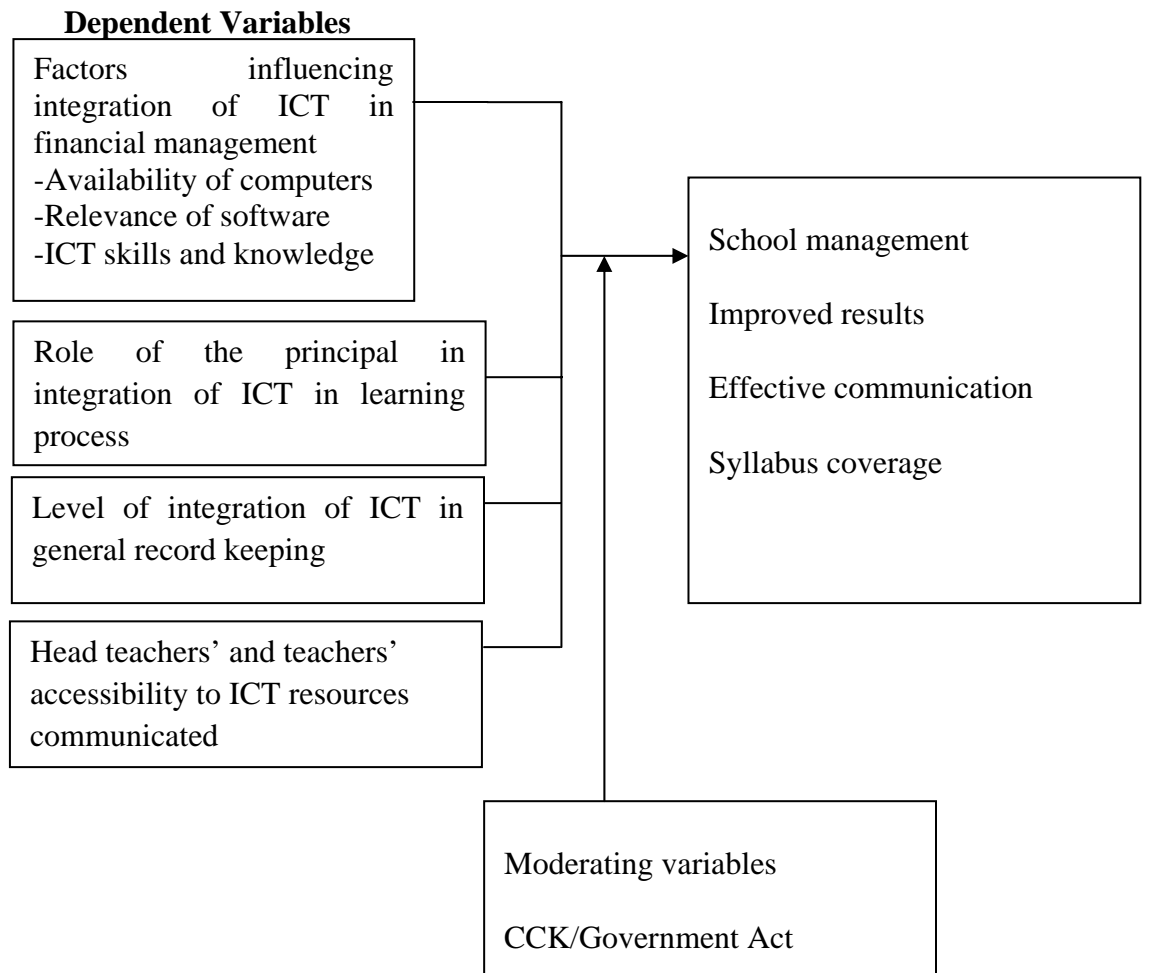
In general, several studies have identified a range of the following or similar factors as widespread barriers: lack of computers, lack of quality software, lack of time, technical problems, teachers' attitudes towards computers, poor funding, lack of teacher confidence, resistance to change, poor administrative support, lack of computer skills, poor fit with the curriculum, lack of incentives, scheduling difficulties, poor training opportunities, and lack of skills in how to integrate ICT in education.

2.7 Conceptual Framework

The study adopted a conceptual framework as shown below.

Figure 1.1 Conceptual Framework

Independent Variables



Source: Author, (2013)

CHAPTER THREE

3.0 RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The purpose of this chapter is to provide a description of the research design, study area, the target population, sample size and sampling techniques, research instruments, validity and reliability of the research instruments, data collection procedures and data analysis and presentation. Each of the sub-headings mentioned above is explained separately below.

3.2 Research Design

Research design is defined as a plan, structure or strategy of investigation so conceived as to obtain answers to research questions or problem. This study used descriptive survey research design. This design gathers data at a particular point in time with the intention of describing the nature of the existing conditions, identifying the standards against which existing conditions can be compared and determining the relationship that exists between specific events (Orodho, 2005). Descriptive Survey research design was suitable in this study since the population to be studied was too large to be observed directly. In choosing a design to be used, several factors are taken into consideration. Therefore, descriptive survey research design was suitable in this case to help describing the factors. In addition, the study population was too large to be observed directly and therefore the design enabled the researcher to describe the existing conditions.

3.3 Study Area

The study was conducted in West Pokot County. This area was selected because there has been no similar research conducted in the area. It was hoped that the district will give a wide and varied view of the problem under study. However, it must be observed that the choice of the area does not render other parts of the country less significant

3.4 Study population

Mugenda and Mugenda (1999) define a population as a complete set of individuals, cases, or objects with some common observable characteristics. A target population is that of population to which a researcher wants to generalize results of a study. The study targeted 47 public secondary schools in West Pokot County which comprised of secondary school principals and teachers.

3.5 Sample Size

Presently there are 47 public secondary schools in West Pokot County. The schools were stratified into educational divisions from which 15 schools were selected for participation in this study. All principals from the selected schools were included in the study sample through purposive sampling design, while 30% of teachers were selected through random sampling. According to Dalen (1979) a sample of between 10-30% of the total population is appropriate for the study. For Kerlinger (1983) a sample of 30% is an adequate representation of the population to be studied.

3.6 Data Collection Instruments

The data collection instruments are tools used to collect information from the intended sample size. The data collection instruments used in this study were designed and developed by the researcher. These included questionnaires and an interview schedule.

3.6.1 Questionnaires

This is a collection of items to which a respondent is expected to react in writing. This method collects a lot of information over a short period of time. The advantages of questionnaires are that they give a considerable amount of questionnaire information and enable the researcher to obtain a wide coverage of description data at low cost in terms of time and money. It allows uniformity in the manner in which questions are to be compared across respondents Manion, (eds), (1994). This method is also suitable when the information needed can be easily described in writing and if time is limited. In this study, the respondents were given enough time to complete the copies of the questionnaire before they are collected for analysis to allow the respondents to give their own views. They were administered to teachers.

3.6.2 Interview Schedule

An interview as a method of collecting data involves presentation or oral-verbal stimuli and reply in terms of oral-verbal responses Kothari (2004). Interview method provide in depth and qualitative data as it presents opportunity to explain the purpose of study. It ensured that views and options

are clarified which could not be captured by the questionnaires. The interview schedules were administered to principals.

3.7 Data Collection Procedure

This refers to the collection or gathering of information to serve some facts (Kombo and Tromp 2006:99). It involves the real process of the field to get the required information from the selected population. The researcher got permission from the Dean School of Education in UON in writing to enable him to get research permit from the Ministry of higher Education Science and Technology before proceeding to the field. After acquiring the permit the research further sought permission from the District Education Office as well as the Assistant Education Office to enable the research conduct research in schools. Further the researcher sought permission from the head teachers of the selected schools for the study. On the actual dates of the study, the researcher visited individual schools to conduct the research.

3.8 Validity and Reliability of Research Instrument

3.8.1 Validity of Research Instrument

Validity refers to the extent to which a research instrument measures what it designed to measure for the purpose of validation. According to Mugenda (1999) validity is the degree to which results obtained from analysis of data actually represent the phenomenon under study. Therefore questionnaire or interview schedules are said to be valid when they actually measure the intended parameters. The need to test the content validity of the research

instrument is inevitable. This ascertained that the item produced was relevant to the objectives of the study.

The research sought assistance from the experts in the Educational Management and Policy Studies Department. He also consulted with colleagues and then made corrections to allow for adjustments in the tools. Piloting made the researcher to realize shortcomings in the research instruments and make necessary adjustments before embarking on the actual study.

3.8.2 Reliability of Research Instrument

Reliability is the measure of the degree to which a research yields consistent result or data after repeated trials. It is the degree of consistency that the research instruments or procedures demonstrate. It is the reproducibility of a measurement. It is qualified by taking several measurements on the same subjects. Poor reliability degrades the precision of single measurement and reduces the ability to track changes in measurement in a study (Mislevy, 2004). The reliability of data collection instruments was determined from the pilot study that was done in the neighboring West Pokot. This is because the area of study and the pilot district were formerly under one district called Trans-Nzoia district. The research instruments were administered to the same respondents twice after a period of two weeks. The Cronbachs coefficient alpha was used to calculate the correlation. A correlation coefficient alpha of 0.75 and above was taken as a good measure to test reliability (Orodho 2005).

3.9 Data analysis and presentation

The data to be collected for the purpose of the study was adopted and coded using SPSS for accuracy and completeness. The responses from the questionnaire were analyzed to show certain important aspects. Descriptive statistics were used to analyze data. The specific descriptive statistics used were frequencies, percentages, means and modes. Since the study is descriptive, the first step is to code the questionnaire responses and calculate the frequency of each response. The frequency tables were prepared for closed and open-ended questions so as to convey meaning of data after analyzing qualitatively, and the results were reported in chapter four. Data was presented using tables, charts and bar graphs.

3.10 Ethical Considerations

The researcher explained to the respondents the purpose of the study and all the respondents were assured of the confidentiality of the information they gave. The researcher assured them that the names of the schools and those of respondents will not be revealed anywhere. The respondents were also assured of getting the feedback from the research after completion of the study. This aimed at securing co-operation from them. The researcher also established a rapport with the respondents so as to facilitate the collection of data.

CHAPTER FOUR

DATA ANALYSIS PRESENTATION AND INTERPRETATION

4.1 INTRODUCTION

This chapter presents and analyses the data collected from the teachers. The data obtained from the questionnaire was analyzed using descriptive statistics such as frequencies and percentages. The purpose of this study was to investigate the utilization of Computer in school administration among secondary schools in West Pokot County.

4.1 Background information

The section presents finding on background information of the respondents

4.1.1 Gender of the Respondents

When the teachers were asked to state their gender, their responses were as shown Table 4.1

Table 4.1 Gender of the Respondents

Gender	Frequency	Percentage
Male	49	65.3
Female	26	34..7
Total	75	100.0

It is revealed from the 49(65.3%) of the respondents were male while 26(34.7%) were female. This implies there are more male teachers than female teachers in secondary schools.

4.1.2 Age Brackets of the Respondents

The respondents too were asked to state their age. Their responses were as shown in the table below.

Table 4.2 Age of the Respondents

Age	Frequency	Percentage
25-30years	35	46.7
30-35years	15	20.0
35-45 years	22	29.3
Total	75	100.00

It is shown from the table that 35(46.7%) of the teachers were 25-30 years old.

The remaining 25(33.3%) of the respondents were aged 35-45 years old.

4.1.3 Level of professional Qualification of the Respondents

The respondents were also asked to state their level of professional qualification. Table 4.3 presents the findings.

Table 4.3 Level of professional Qualification

Professional Qualification	Frequency	Percentage
SI/Diploma	9	12.0
Untrained	5	6.7
Degree	55	73.3
M.Phil. Ed	6	8.0
Total	75	100.0

It is instructive to note from the table that majority 55(73.3%) of the respondents had a degree while 9(12.0%) of them had SI/Diploma. Further, another 6(8.0%) had M.Phil. Ed while the remaining 5(6.7%) were untrained. This implies majority of eth teachers had the qualification to teach in secondary schools.

4.1.4 Working Experience of the Respondents

It was also necessary to find out the working experience of the respondents.

Table 4.4 below has the findings.

Table 4.4 Working Experience of the Respondents

Working Experience	Frequency	Percentages
Less than 5 years	35	46.7
6-10 years	12	16.0
Over 10years	28	37.3
Total	75	100.00

It is shown that 35(46.7%) of the respondents had taught for less than 5 years while 12(16.0%) had taught for 6-10 years. The remaining 28(37.3%) of the respondents had taught for over 10 years.

4.1.5 Responsibility

The respondents were requested to state the responsibility they held and their responses are contained in Table 4.5.

Table 4.5 Responsibility

Responsibility	Frequency	Percentage
Classroom teacher	53	70.7
Head of department	22	29.3
Total	75	100.0

The table reveals that 53(70.7%) of the respondents were classroom teachers while the remaining 22(29.3%) were heads of department.

4.2.0 Role of the Principal in determination of Computer in School Administration.

The teachers were asked to give their views on various roles of eth principal in Computer determination is school administration. Table 4.6 below has the findings.

Table 4.6 Role of the Principal in Determination of Computer in School Administration

Statement	A		N		D		TOTAL	
	f	%	f	%	f	%	f	%
Enhancing staff training and development	63	84.0	3	4.0	9	12.0	75	100
Mobilizing resources necessary for Computer determination	72	96.0	0	0	3	4.0	75	100
Encouraging staff to embrace Computers	63	84.0	0	0	12	16.0	75	100

Recognizing and rewarding efforts made by staff in Computer determination	48	64.0	10	13.3	17	22.7	75	100
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It is instructive to note from the table that 63(84.0%) of the respondents reported that the principal enhances staff training and development while 9(12.0%) disagreed on this view. The remaining 3(4.0%) were neutral. Further, it is revealed that majority 72(96.0%) of the respondents agreed that the head teacher mobilizes resources necessary for Computer determination, while a few 3(4.0%) of the respondents did not agree. It is disclosed from the table that 63(84.0%) of the respondents agreed that the role of head teacher in Determination of Computer in administration in encouraging staff to embrace Computer while 12(16.0%) of the respondents did not agree. The study reveals that the principal recognizes and rewards efforts made by staff in Computer Determination as a way of Determining Computer in school administration. This view was held by 48(64.0%) of the respondents while 17(22.7%) of the respondents objected this view. The rest 10(13.3%) of eth respondents were neutral.

From the above analysis, it can be concluded that the most principals enhances staff training and development mobilizes resources necessary for Computer and encourages staff to embrace Computer. It is also implied that majority of principals recognize and reward efforts made by staff in Computer Determination.

4.3.0 Level of Determine of Computer in School Administration

The study sought to investigate the level of determination of Computer in school administration and the findings from the teachers are presented in Table 4.7.

Table 4.7 Level of Determination of Computer in school Administration

Statement	A		N		D		TOTAL	
	f	%	f	%	f	%	f	%
Roles of eth principal and teachers have been made easier with Computer introduction.	58	77.4	9	12.0	8	10.7	75	100
I have acquired enough technical skills on the use of Computer through training	45	60.0	8	10.7	22	29.4	75	100
Most of eth time I use ICT to collect and analyze data in school	33	44.0	9	12.0	33	44.0	75	100
Using Computer has improved my join performance in managing students data	58	77.3	3	4.0	14	18.7	75	100
I feel the quality of students record produced by Computer is better	73	77.3	2	2.7	0	0	75	100
I feel Computer generated data have improved the efficiency of the school administration	75	100	0	0	0	0	75	100

It is disclosed from the table that 58(77.4%) of eth respondents agreed that the roles of the principal and teachers had been made easier with Computer

Introduction whereas 8(10.7%) of the respondents disagree. The remaining 9(12.0%) of the respondents were neutral.

Further, is disclosed that 45(60.0%) of the respondents agreed that they had acquired technical skills on the use of Computer through training while 22(29.4%) of the respondents reported they had acquired the skills through training. The remaining 8(10.7%) of the respondents were neutral. It is instructive to note from the table that 33(44.0%) of the respondents agreed that most of the time they used Computers to collect and analyze data in school while another 33(44.0%) of them disagreed on this view. The remaining 9(12.0%) of the respondents were neutral.

It is further revealed that 58(77.3%) of the respondents agreed that using Computer had improved their job performance in managing students' data while 14(18.7%) of the respondents did not agree. The remaining 3(4.0%) were neutral. A finding on student records shows that 73(97.3%) of them agreed that the quality of students records produced by Computer is better whereas the remaining 2(2.7%) were neutral. It is also shown that all the respondents felt that the above findings, it can be concluded that the use of Computer in school management has improved the quality of information and made the school more efficient while performing its tasks.

4.4.0 Head teachers' and teachers' Accessibility to Computer Resources

The study sought to establish the extent of headteachers' and teachers' accessibility to Computer resources and the findings are contained in Table 4.8

Table 4.8 Head teachers' and teachers' accessibility to Computer Resources

Statement	A		N		D		TOTAL	
	f	%	f	%	f	%	f	%
Computer are only available in the headteacher's office	15	20.0	0	0	60	80.0	75	100
There is no adequate software/programmes for data	47	62.7	9	12.0	19	25.4	75	100
Computer are too few	53	70.7	3	4.0	19	25.4	75	100
Computers are not free when I want to use them	36	48.0	12	16.0	27	36.0	75	100

It is instructive to note from the table that a few 15(20.0%) of the respondents agreed that computers are only available in the head teachers office while 60(80.0%) of the respondents did not agree on this opinion. From the above analysis, it is shown that 47(62.7%) of the respondents agreed that there is no adequate software/programmes for data whereas 9(25.4%) of the respondents objected this opinion. The remaining 9(12.0%) of the respondents were neutral. Findings on the availability of computers revealed that 53(70.7%) of

the respondents agreed that computers are too few while 19(25.4%) of the respondents disagreed. The rest 3(4.0%) of the respondents were neutral.

It is further revealed that 36(48.0%) of the respondents agreed that computers were not free when they wanted to use them while 27(36.0%) did not agree. The remaining 12(16.0%) of the respondents were neutral. From the above findings, it can be concluded that computers are few and the ones available lack adequate software programmes. This therefore limits accessibility of the teachers to Computer resources. There is therefore limited accessibility to Computer schools.

4.5.0 Barriers to Determination of Computer in School Administration

The study was also aimed at determining barriers to determination of Computer in school administration. The findings are continued in Table 4.9.

Table 4.9 Barriers to Determination of Computer in School Administration

Statement	A		N		D		TOTAL	
	f	%	f	%	f	%	f	%
Software are too difficult or complex to use them	29	38.7	5	6.7	41	54.7	75	100
Software are not adaptable enough for administrative	27	36.0	3	4.0	45	60.0	75	100
I don't use computers because I	34	45.3	0	0	41	54.7	75	100

lack time									
I don't use computers because I	30	40.0	8	10.7	37	49.3	75	100	
lack necessary skills									
I don't use computers for	23	30.7	5	6.7	47	62.6	75	100	
administrative work because of									
lack of interest									
I don't use computers because	23	30.7	3	4.0	49	65.4	75	100	
they are not available									

It is revealed from the table that 29(38.7%) of the respondents agreed that software are too difficult / or complex to use while 41(54.7%) disagreed on the opinion. The remaining 5(6.7%) of the respondents were neutral. It is also shown that 27(36.0%) of the respondents agreed that software is not adaptable enough for administrative functions whereas 45(60.0%) of the respondents disagreed. The remaining 3(4.0%) of the respondents were neutral.

It is further disclosed from the table that 34(45.3%) of the respondents agreed that they did not use computers because of lack of time whereas 41(54.7%) of the respondents disagreed. At the same time, it is shown that 30(40.0%) of the respondents agreed that they did not use computers due to lack of necessary skills whereas 37(49.3%) of the respondents disagreed. The remaining 23(10.7%) of the respondents were neutral. It is also disclosed that 23(30.7%) of the respondents agreed that they did not use computers for administrative work because of lack of interest while 47(62.6%) of them felt otherwise. The

remaining 5(6.7%) of the respondents were neutral. Concerning availability of computers, it is revealed that 23(30.7%) of the respondents agreed that they did not use computers because they are not available while 49(65.4%) of the respondents disagreed on the same. The remaining 3(4.0%) were neutral.

From the analysis barriers to integration of Computer in school administration in some schools include different software, lack of time, lack of necessary skills and to a small extent lack of interest by the teachers. It is also revealed some extent that unavailability of computers hinders use of Computers determination in school management.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMEDATIONS

5.1 Introduction

This chapter presents the discussion of the findings, conclusions, recommendations and suggestions for further research. This study was carried out with the main purpose of finding out utilization of computers in management of secondary schools in Kenya, a case of West Pokot County, Kenya.

5.2 Summary of findings

5.2.1 General Information on the respondents

It was revealed that 65.3% of the respondents were male while 34.7% were female. It was shown that 46.7% of the teachers were 25-39 years old. The remaining 33.3% of the respondents were aged 35-45 years old. A finding on professional qualifications revealed that majority (73.3%) of the respondents had a degree while 12.0% of them had SI/ Diploma. Further, another 8.0% had M. Phil.Ed while the remaining 6.7% were untrained. It was also necessary to find out the working experience of the respondents. It was shown that 46.7% of the respondents had taught for less than 5 years while 16.0% had taught for 6-10 years. The remaining 37.3% of the respondents had taught for over 10 years. Concerning responsibility held, the study revealed that 70.7%

of the respondents were classroom teachers while the remaining 29.3% were heads of department.

5.2.2 Roles of the principal in Determination of Computer in School Administration

The teachers were asked to give their views on various roles of the principals in Computer Determination in school administration. It is instructive to note from the study findings that 84.0% of the respondents reported that the principal enhances staff training and development while 12.0% disagreed on this view. The remaining 4.0% were neutral.

Further, it was revealed that majority 96.0% of the respondents agreed that the head teacher mobilized resources necessary for Computer determination, while a few 4.0% of the respondents did not agree. It was disclosed from the study that 84.0% of the respondents agreed that the role of head teacher in determination of computer in administration was to encourage staff to embrace Computer while 16.0% of the respondents did not agree. The study revealed that the principal recognized and rewarded efforts made by staff in Computer determination as a way of determining computers in school administration. This view was held by 64.0% of the respondents while 22.7% of the respondents objected this view. The rest (13.3) of the respondents were neutral.

5.2.3 Level of Determination of computer in School Administration

The study sought to investigate the level of determination of computer in school administration and the findings disclosed that 77.4% of the respondents agreed that the roles of principal and teachers had been made easier with computer introduction whereas 10.7% of the respondents disagreed. The remaining 12.0% of the respondents were neutral. Further, it was disclosed that 60.0% of the respondents agreed that they had acquired technical skills on the use of Computer through training while 29.4% of the respondents reported they had acquired the skills through training. The remaining 10.7% of the respondents were neutral. It is instructive to note from the study findings that 44.0% of the respondents agreed that most of the time they used Computer to collect and analyze data in school while another 44.0% of them disagreed on this view. The remaining 12.0% of the respondents were neutral.

It was further revealed that 77.3% of the respondents agreed that using Computer had improved their job performance in managing students' data while 18.7% of the respondents did not agree. The remaining 4.0 were neutral.

A finding on student records showed that 97.3% of the respondents agreed that the quality of students' record produced by Computer was better whereas the remaining 2.7% of the respondents were neutral. It was also shown that all the respondents felt that the computer generated data had improved the efficiency of school administration.

5.2.4 Head teachers' and Teachers' Accessibility to Computer resources

The other objective of the study was to establish the extent of headteachers' and teachers' accessibility to computer resources. It was revealed from the study that a few (20.0%) of the respondents agreed that computers were only available in the head teachers' office while 80.0% of the respondents did not agree on agree on this opinion. From the analysis done, it was shown that 62.7% of the respondents agreed that there was no adequate software / programme for data whereas 25.4% of the respondents objected this opinion. The remaining 12.0% of the respondents were neutral. Findings on the availability of computers revealed that 70.7% of the respondents agreed that computers were too few while 25.4% of the respondents disagreed. The rest (4.0%) of the respondents were neutral. It was further revealed that 48.0% of the respondents agreed that computers were not free when they wanted to use them while 36.0% did not agree. The remaining 16.0% of the respondents were neutral.

5.2.5 Barriers to Determination of Computer in School Administration

The study was also aimed at determining barriers to determination of computers in school administration. The findings revealed from that 38.7% of the respondents agreed that software were too difficult / or complex to use while 54.7% disagreed on this opinion. The remaining 6.7% of the respondents were neutral. It was also shown that 36.0% of the respondents

agreed that software was not adaptable enough for administrative functions whereas 60.0% of the respondents disagreed. The remaining 4.0% of the respondents were neutral.

It was further disclosed from the study that 45.3% of the respondents agreed that they did not use computers because of lack of time whereas 54.7% of the respondents disagreed.

At the same time, it was shown that 4.0% of the respondents agreed that they did not use computers due to lack of necessary skills whereas 49.3% of the respondents disagreed. The remaining 10.7% of the respondents were neutral.

It was also disclosed that 30.7% of the respondents agreed that they did not use computers for administrative work because of lack of interest while 62.6% of them felt otherwise. The remaining 6.7% of the respondents were neutral.

Concerning availability of computers it was revealed that 30.7% of the respondents agreed that they did not use computers because they were not available while 65.4% of the respondents disagreed on the same. The remaining 4.0% were neutral.

5.3 Conclusions

Based on the findings of this study that sought to determine the utilization of computers in management of secondary schools in Kenya, a case of West Pokot County, Kenya, the following conclusions are made:-

Most of the principals enhanced staff training and development and mobilized resources necessary for computers and encourages staff to embrace computer. It is also implied that majority of the principals recognize and reward efforts made by staff in Computer integration

The other objective of the study was to investigate the level of integration of computer in school administration. As a result, it was established that use of computer in school management had improved the quality of information and made the school more efficient while performing its tasks.

The study revealed that accessibility by the teachers to computers resources was hampered by the number of computers. From the analysis done in chapter four, it can be concluded that computers were few and the ones available lacked adequate software programmes. This therefore limited accessibility of the teachers to compute resources. There is therefore limited accessibility to Computer in schools.

From the analysis done, it was revealed that barriers to integration of computer in school administration in some schools included difficulty in suing software, lack of time, lack of necessary skills and to a small extent lack of interest by the teachers. It is also revealed that to some extent that unavailability of computers hindered use of computers integration in school management.

5.4 Recommendations

Based on the findings and conclusions of the study, the study made following recommendations to improve ICT/computerization in schools' management.

- 1) Head teachers and teachers should work together as a team towards enhancing the determination of computer in school administration. All educational stakeholders should also be involved in the provision of computer materials and infrastructure in order to create conducive environment for its determination.
- 2) Headteachers and teachers should be in-serviced so that they can acquire adequate skills to use in determination of computer in school administration.
- 3) The government should ensure accessibility of computers to all schools in the country through partnering with other educational stakeholders to ensure that ICT can aid school managers in management of schools.

5.5 Suggestions for Further Research

The scope of the study was based on the utilization of computers in management of secondary schools in Kenya, a case of West Pokot County, Kenya. This was therefore not exhaustive and the following suggestions on areas of further research can be taken up.

- 1) Effect of Computer determination in school administration on academic performance of student.
- 2) Training needs of the teachers on Computer for effective integration

- 1) A similar study also needs to be carried out in an urban setting to compare the difference of availability and impact of ICT resources with the rural setting in terms of school management and the effectiveness of teaching/learning activities.

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APPENDIX I:

QUESTIONNAIRE FOR TEACHERS INTRODUCTION

This questionnaire seeks to investigate factors affecting integration of ICT in school administration among secondary schools of the west Pokot County.

You are one of the participants selected for this exercise. Your response will be treated with confidentiality during and after the study. Let me take this opportunity to thank you in advance for taking part in this study.

SECTION 1: PERSONAL INFORMATION

N.B; Please respond by ticking all that apply

1. Indicate your gender

Male () Female ()

2. Indicate your age in years

25-30Years () 30-35 Years () 35-45 Years () 45 and above Years ()

3. What is your level of professional qualification?

S/I Diploma () Untrained () Degree () M. PHIL Ed () any

other ()

4. Indicate your working experience in terms of years

Less than 5 years () 6-10 years () Over 10 years ()

5. Current status / Responsibility

Classroom teacher () Head of Department () Deputy Head Teacher () Head teacher ()

ROLE OF THE PRINCIPAL IN INTEGRATION OF ICT IN SCHOOL ADMINISTRATION

6. The following statements relate to the role of the Principal in integration of ICT in school administration. Using the rating given below, provide your response in relation to the extent to which you agree to the statements, strongly agree (SA) Agree (A) Neutral (N) Strongly disagree (SD).

ITEM	STATEMENT	SA	A	N	D	SD
1	Enhancing staff training and development					
2	Mobilizing resources necessary for ICT integration					
3	Encouraging staff to embrace ICT					
4	Recognizing and rewarding efforts made by staff in ICT integration					

LEVEL OF INTEGRATION

7. The following statements relate to the level in integration of ICT in School Administration. Using the rating given below, provide your response in relation to the extent to which you agree to the statements. Strongly Agree (SA) Agree (A) Neutral (N) Disagree (D) Strongly Disagree (SD)

ITEM	STATEMENT	SA	A	N	D	SD
1	Role of Principal and teachers have been made easier with ICT introduction					
2	I have acquired enough technical skills on the use of ICT through training					
3	Most of the time I use ICT to collect and					

	analyze data in school					
4	Using ICT has improved my job performance in managing students data					
5	I feel the quality of students records produced by ICT is better					
6	I feel ICT generated data have improved the efficiency of school administration.					

ACCESS TO ICT RESOURCES

8. The following statements relate to access to ICT resources in school administration. Using the rating given below, provide your response in relation to the extent to which you agree to the statements, Strongly Agree (SA) Agree (A) Neutral (N) Disagree (D) Strongly disagree (SD)

ITEM	STATEMENT	SA	A	N	D	SD
1	Computers are only available in the Head teachers' office					
2	There is no adequate software/ programmes for data					
3	Computers are too few					
4	Computers are not free when I want to use them					
5	Software are too difficult or complex to use them					
6	Software are not adaptable enough for administrative work					

BARRIERS TO ICT USE IN SCHOOL ADMINISTRATION

9. The following statements relate to ICT use in school administration. Using the rating given below, provide your response in relation to the extent to which you agree to the statements.

Strongly Agree (SA) Agree (A) Neutral (N) Disagree (D) Strongly disagree (SD)

ITEM	STATEMENT	SA	A	N	D	SD
1	I do not use Computer because I lack one					
2	I do not use computer because I lack necessary skills					
3	I do not use Computers for administrative work because of lack of interest					
4	I do not use Computers because they are not available					
5	Any other reason (Please)					

APPENDIX II:

INTERVIEW SCHEDULE FOR PRINCIPAL'S

- 1) In your own understanding, what is information communication technology?
- 2) In your own view what do you consider the role of the Principal in integration of ICT in School administration
- 3) What are the information communication technology tools used in Secondary schools in west Pokot County
- 4) How can you gauge the level of literacy among Secondary School Principals and teachers in West Pokot County
- 5) In your own view , what is the extent of use and application of ICT tools in Secondary Schools in West Pokot County
- 6) How do you rate the level of penetration of ICT in Secondary Schools In West Pokot
- 7) What do you consider as barriers of ICT utilization in curriculum management in secondary schools in West Pokot
- 8) How can you rate the extent of the Head teacher's and teachers accessibility to ICT resources