Utilization of Information Communication Technology (ICT)

In the Selected Secondary Schools

A Case of Buikwe District - Uganda

A Post Graduate Dissertation Presented to the Faculty of Computer Science in Partial

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DEDICATION

This work is dedicated to my wife Rosette Namugenyi, my parents Edward and Allen Kisawuzi and my children.Timothy Kisawuzi , Isaac Mpungu and Rebecca Nambajjwe for their endurance during my study period. I also appreciate my dear parents who worked so hard in ensuring that I achieved education despite the many challenges then.

ACKNOWLEDGEMENT

LIST OF ABBREVIATIONS

ICT   :   Information and Communication Technology

DEEP   :   Digital Education Enhancement Project

SSA   :   Sub- Saharan Africa

CFSK   :   Computers for Schools, Kenya

ICTD   :   Information and Communication Technology for Development

NGOs   :   Non-Governmental Organizations

CSTS   :   Cyber-Schools Technology Solutions

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ABSTRAT

The study focused on the Utilization of Information Communication Technology (ICT) in the selected secondary schools; a case of Buikwe District – Uganda. The study objectively thought to; identify the level of ICT usage in the teaching/learning programs in selected secondary schools, to establish the various factors hindering the effective utilization of ICTs in education programmes in selected secondary schools, to suggest possible remedies to the challenges which hinder ICT utilization in the selected secondary schools. The study adopted a case study research design which complimented the objective and research problem in that it provides descriptive accounts of the role of Information Communication Technology(ICT) the learning/teaching, yet can also be used in an intellectually rigorous manner to achieve experimental isolation of one or more selected schools within Buikwe District. A sample of 228 respondents was selected. Using, purposive sampling and simple random data was analyzed using the computer software called SPSS to generate tables and graphs. The findings of the study were that it was discovered that students and the teachers had some skills and competence in using computers in learning or instructional environments, Lack of confidence or know-how on how to handle the different ICTs equipments would make both students and teachers shun ICTs in training or learning and there should be developing the policies and plans for diffusion of ICTs in learning and teaching, students should be encouraged to participate in ICT practical's in the same way respondents also strongly agreed that students should be encouraged to participate in ICT practical. The study concluded that the demand for higher education in developing countries is surpassing the physical resources and time that are at the disposal of higher education schools that are in these developing countries. The study recommends that Policy makers, providers of professional development programs for principals and for system level decision makers to support mechanism and strategies to assist Head teacher and secondary school owners, It is also imperative that the Ministry of Education comes up with policies that will guide the use of ICT in schools and there is need for the Ministry of Education to develop an ICT policy to streamline this important area of learning.

CHAPTER ONE

INTRODUCTION

Introduction

This study was undertaken in order to ascertain the relationship Information Communication Technology (ICT) and education programmes in the selected secondary schools in Buikwe District. This chapter presents the background to the study, statement of the problem, purpose of the study, specific objectives, research questions, scope of the study, significance of the study and operational definition of the key variables and conceptual framework.

1.1 Background to the study

Information and Communication Technology (ICT) is pervasive within organizations. It is brought into organizations by people and is put to work by people. The ways in which technology is used and the purposes for which it is used, is a result of the decisions taken by members of the organization especially its leaders. It is essential, therefore, that managers have an understanding of the nature of new technology, the organizational needs and objectives. From an organizational context, several approaches to conceptualizing technology in general have been advanced. Burnes, (2003) observes that the outcomes of technological change are socially chosen and negotiated within organizations by organizational actors. Pettigrew (1990) examined organizational politics and decision-making associated with the development and structuring of computer applications and found that managers are able to influence decisions in the computerization domain through taking up a 'gatekeeper' role, which allows them to shape the information reaching key managerial decision-makers. Political behavior associated with organizational and human resource issues arising out of technological change, demonstrates a range of choices available with respect to work organization and control of jobs. It appears, therefore, that the outcomes of technological change within organizations are dependent on the way workers respond, adapt and try to influence the outcome.

In light of the above arguments we look to the domain of ICT4D where the World Bank Report 2003 suggests that, large numbers of elementary schoolteachers will be needed to meet the MDGs educational targets. ICT is seen as a powerful tool for training as it transfers knowledge to the person most likely to achieve effective dissemination. Moreover, ICT has the potential to increase the availability of quality educational materials through interactivity and global reach, and by

sharing knowledge, materials and databases quickly and cheaply independent of geographic distances (World Bank 2003).

As noted in the UNESCO World Education Report, (1998), the young generation is entering a world that is changing in all spheres: scientific and technological, political, economic, social and cultural. The emergence of a knowledge-based society is changing the global economy and the status of education. Consequently, teacher education institutions are faced with the challenge of preparing a new generation of teachers to effectively use the new learning tools in their teaching practices. For many teachers' education programs, this task requires the acquisition of new resources, expertise and careful planning.

Supporters of ICT use in the learning process argue that the existing cost analyses of ICT use for teacher education in developing contexts is likely to be inflated because they are based on outmoded forms and uses of ICT without taking account of a range of important factors including the significant recent development in cost-effective, powerful mobile technologies Digital Education Enhancement Project (DEEP, 2004). The DEEP Project argues that school based professional development permits ICT to simultaneously provide the medium, context and content for teachers' personal and professional development as well as helps improve the curriculum, school and classroom practices and students' learning activities. They (DEEP project) further argue that as opposed to ICT teacher training(i.e. off-site courses) or ICT provision in schools (i.e. individual students' IT skills),evidence from the project shows that teachers and students can easily develop a range of ICT skills in the process of using digital technologies for curriculum purposes, provided collaborative and peer learning approaches are exploited. The DEEP research results show that new digital technologies are appropriate for use in the African context as they have the potential to revolutionize the quality of training when carefully integrated within programmes that are pedagogically strong and well supported (DEEP, 2010).

In Africa, most governments in the Sub- Saharan Africa (SSA) took initiative to install computer and other technology resources to enhance teaching and learning in schools (Mangesi, 2007). Until now, most SSA countries including; Botswana, Mauritius, Nigeria, Senegal and Ghana have to some extent developed their national ICT policies. These policies provide the foundation upon which ICT both at the national level and at the educational sector level is set. In East Africa, all of

the five countries namely, Kenya, Tanzania, Uganda, Burundi, Rwanda and South Sudan have developed a national ICT strategy at different times (Hennessy, 2010).

Due to its perceived importance in enhancing teaching and learning that can improve academic performance, studies have from time to time recommended methodology needed for effective utilization of ICT in education. UNESCO (2014) in its articulation of e-readiness as a framework for quantifying ICT in education across Asia, views e-readiness as involving: policy development, curriculum development, physical infrastructures, ICT infrastructures and teacher preparedness. Similarly, Bartlett et al (2013) proposed six innovative areas that are essential for the utilization of ICT in secondary schools. These are: Physical Infrastructure, ICT infrastructure, Teacher ICT and Pedagogical Skills and Knowledge, Open Source Teaching and Learning Resources, Student ICT Participation and Knowledge and -Public-Private Partnership Implementation.

From a theoretical point of view, scholars such as Rogers (2003) argue that potential adopters of a technology progress over time through five stages in the diffusion process. First, they must learn about the innovation (knowledge); second, they must be persuaded of the value of the innovation (persuasion); thirdly, they must decide to adopt it (decision); fourthly, the innovation must be implemented (implementation); and finally, the decision must be reaffirmed or rejected (confirmation). In this model, the user or adopter is critical in the whole process. Another perspective advanced to address ICT adoption and usage, is the Technology Acceptance Model (TAM) advocated by Davis (1989) and Chuttur (2009). In general, this theory states that a behavior is determined by intention to perform the behavior. Actual behavior and intention have been found to be highly correlated (Fishbein and Ajzen 1980). Intention, itself, is determined by attitude towards behavior. Davis' research, in essence, examines the external variables that determine or influence attitude towards ICT use. The TAM identifies perceived ease of use and perceived usefulness as key independent variables (Davis 1989). Perceived ease of use also influences perceived usefulness. The Technology Acceptance Model assumes that behavior is voluntary or at the discretion of the user. A number of studies have identified the school principal as a critical and pivotal person for 'establishing and maintaining learning environments compatible with student-centered approaches to teaching and learning with ICT' (Afshari et al. 2008). They are also seen as curriculum and pedagogy leaders and are considered by stakeholders as central figures in leading processes for creating the conditions to teach and learn with ICT. From these

arguments, it appears school leadership plays a key role in ICT integration in education. The competence of the School Manager in the use of ICT and a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education is important to the effectiveness and sustainability of ICT integration programmes.

Among the various studies carried out to establish the status of ICT integration and the variables influencing it, some have focused on the role of the School Manager, in the adoption and use of ICT in education. Many scholars and policy makers seem to agree that School Principals as institutional managers have a key role to play in the facilitation of educational change (Schiller, 2003; Gronow, 2007 and Tondeur et al. 2007) especially in this decade when Information and Communication Technologies are increasingly finding application in teaching and learning. It appears that ICTs and especially the computer, has moved from being the object of study to a learning tool in the classroom and teachers are increasingly being expected to have basic ICT skills and able to apply them in their teaching. By playing an active role in the adoption of ICT as an educational tool, principals can create an environment that will benefit their teachers and students.

Acquisition of a limited number of computers initially by schools for management purposes appears, to have created the conditions necessary to introduce, albeit gradually, integration of ICT in teaching and learning. It could be argued, therefore, that once management adopts ICT in its practices, it diffuses and spreads to other institutional members and they become interested in its use. As such, even without a plan or designed way of integration, some teachers with the inclination and interest in ICT end up finding innovative ways of using it to enhance their teaching capacities. Initially it may be used for recording and analyzing marks, typing lesson plans and eventually actual teaching and learning by searching for information and displaying learning content. Learners, equally, given the opportunity and access, are able to use ICT to enhance their learning.

Many countries around the world have established organizations for the promotion of the Information and Communication Technology (ICT) in education in general and with respect to teacher education in particular. There is, however, a clear gap between technological "have" and "have not" regions. The United Nations and the World Bank actively promote ICT for Development (ICT4D) as a means of bridging the "digital divide". According to the European Commission, the importance of ICT lies more in its ability to create greater access to information

and communication in under-served populations rather than in the technology itself. In the search for quality education for all, numerous ICT-in-school projects have been launched around the world. One very visible model is the "school net" which introduces computers and Internet connectivity to schools. School nets have been established in Canada, in Europe and South-East Asian countries. Established in 1999, School Net Africa now has school nets in 34 African countries. On the African continent the latest evolutions in this area are the e-schools initiative of the United Nations ICT Task Force and the New Partnership for Africa's Development (NEPAD) schools programme.

The integration of ICT in school management in Kenyan schools has been driven to a large extent by the corporate social responsibility efforts of organizations that initially made donations of old refurbished computers to schools and diffusion of ICT skills in the labour market. In addition, access to electricity and internet connectivity, introduction of other technologies such as the mobile phone, Nepad e-schools project, Computers For Schools, Kenya (CFSK), popularization of computers by government through removal of duty, thus, making them affordable, and more recently, the entrenchment of ICT integration in education through the launch of the National ICT Strategy in Education (2006) and the launch of the National ICT Integration and Innovation Centre at the Kenya Science Campus in Nairobi have created awareness of the place of ICT in education.

Kenya introduced free primary education in 2002 and free day secondary education in 2008. Due to the high numbers of graduates from the primary and secondary levels, the higher education level needs to improve enrollment and quality of their education thus the government has turned to ICTs as an enabler. How ICTs is applied to develop education is important in order to find out areas that need improvement and find better ways that ICTs can be incorporated in education development. Africa in general and Kenya specifically have been lagging behind in engaging ICTs in areas that it can play an important role. ICTs are a major foundation of the economy in both poor and wealthy nations (Mascarenhas, 2010). ICTs can be seen as the main facilitator of the knowledge society, and ICTs can also play an important role in development and in education.

In recent years there have been numerous efforts and resources directed at improving teachers' competence and confidence in using ICT effectively in classroom teaching and learning. Ministries of education are developing policies on ICT in education and running in-service programmes for practicing teachers. Teacher-training institutes are incorporating ICT education in their pre-service

programmes, and many schools are organizing in-house school-based training for their teachers, while worldwide an increasing number of private providers are developing ICT training materials and courses for teachers. According to the Information for Development program (InfoDev, 2005); no standard reference or methodology exists for identifying ICT in education programmes; observations and conclusions on the use of ICT in Africa are drawn from OECD experience (InfoDev 2011).

Although school heads generally support ICT use, they do not seem to have a particular vision and strategy of ICT integration in education (Gakuu and Kidombo, 2010). Some literature has delved into the crucial role of school leadership in ICT integration in education, and shows how school leadership can hinder or facilitate schools adoption of ICT Fullan, 1999; Fullan, 2003 and Elmore, 2000). For example, when the ICT integration tasks are given to one teacher or a small team of teachers who focus more on infrastructural management rather than technology innovation in teaching, staff development and ICT research are more likely to suffer. According to Fullan (2001), the reasons why this role is not played effectively is still not clear, hence need for more studies. Fullan (2003) and Yuen, et al. (2003) also stress the importance of relationships in an organization and emphasize the need for the School Principal to build a team learning environment in which teachers can communicate with each other on ICT experience and reinforce each other's effective practice, thus paving the way for knowledge sharing, especially for tacit knowledge, which refers to skills, beliefs, and understanding below the level of awareness.

The importance of pedagogical application of ICT in Uganda and globally cannot be overemphasized. It is becoming increasingly apparent that all aspects of people's lives including the way education is taught and delivered are greatly influenced by developments in Information and Communication Technologies (ICTs). In an effort to keep up with these new developments, the Uganda Government, through its key ministries of Education, Science and Technology and Information and Communication Technology, has developed several policy and strategy documents to guide the integration of ICT in education (National ICT Policy, 2006; Sessional Paper No. 1 of 2005 and Uganda Education Sector Support Programme, 2005-2010). These efforts are also out of the realization that there are many initiatives being championed by various government agencies, private sector, non-government organizations and even individuals, that are not well coordinated, are disjointed, lack focus and sometimes duplicate each other. In the last

decade, the Government of Uganda has invested numerous resources in ICT infrastructure including the digitization of educational materials through the Uganda Institute of Education (UIE) and The National ICT Integration and Innovation Centre (NIC).

Through the Ministry of Education and sports in collaboration with the ministry of ICT, Uganda Communications Commission, Non-Governmental Organizations and Corporate Companies, a number of government aided schools in various districts including Buikwe district have been equipped with Computer laboratories and selected teachers have been trained in Information and technology them from the respective schools to manage its usage (UCC RCDF Annual Report 2009/10).

1.2 Statement of the problem

The introduction of ICT in education is part of the more fundamental objective to improve education globally and to make it accessible to everyone. Education systems around the world are under increasing pressure to use the new Information and Communication Technologies to teach students the knowledge and skills they need in the 21st Century (Divaharan and Ping, (2014). The 1998 UNESCO World Education Report. In Uganda ICT usage in secondary schools is still at an early stage, and already faces several setbacks that may undermine the various initiatives so far undertaken by government and the private sector to promote the use of Information and Communication Technology tools in schools (Al-Joudi (2013). Based on literature and other research from MOEST ICT policy (2010) documents, this may be attributed to the fact that no structure for ICT adoption in secondary schools that exist for schools such as those in Buikwe district; and most adoption cases are done haphazardly with no systematic approach based on existing tailored towards the real context in the particular schools concerned (Anguyo,(2013).

Although effective utilization of ICT can enhance teaching and learning to improve student academic performance and although Ugandan government has promoted the use of ICT in secondary schools by introducing ICT in school curriculum and facilitating the provision of ICT equipment, the performance of schools where study is confined remains poor (Becker (2000) . Their utilization of ICT is also low due to high student computer ratio, intermittent power supply, unstable and slow internet facilities, regular computer breakdowns and viruses, limited time for practice, congested computer labs, absence of ICT teachers, limited skills in ICT for most learners,

absence of printing services and very old computers with outdated operating systems (World Bank, et al, 2013).

With the increasing realization among various educational and political stakeholders that present-day educational challenges cannot be met with traditional means alone, the increasing advocacy of information and communication technologies (ICTs) as an important contribution to the solution of the problems in education in selected secondary schools, and the need for teachers, to be given training that enables them to integrate new ICTs in their teaching programs, this study aims at investigating how ICTs are currently used at the pre-service and in-service level to train teachers in selected secondary schools (World Bank 2003). They should also ensure that ICTs knowledge is provided to every student regardless to which subjects the student is offering, hence this study.

1.3 General Objective of the study
The study examined the utilization of information communication technology (ICT) in the selected secondary schools; a case of Buikwe District - Uganda

1.4 Specific objectives
  i.   To identify how ICT was used in the teaching/learning programs in selected secondary schools
 ii.   To establish the various factors hindering the effective utilization of ICTs in education programmes in selected secondary schools
iii.   To suggest possible remedies to the challenges which hinder ICT utilization in the selected secondary schools

1.5 Research questions

i. How is ICT used in the teaching/learning programs in selected secondary schools?

ii. What are the various factors hindering the effective utilization of ICTs in education programmes in selected secondary schools?

iii. What possible remedies can be put in place to the challenges which hinder ICT utilization in the selected secondary schools?

1.6 Scope of study

1.6.1 Geographical Scope
The study was carried out the selected private and government secondary schools in Buikwe District and these included; Ngongwe S.S, Malongwe S.S.S and St. Peter S.S Nkokonjeru Stella Maris Nsube S.S this was intended in order to compare and contrast the findings in both private and government schools as far ICT is concerned.

1.6.2 Content Scope
The study identified how ICT was used in the teaching/learning programs in selected secondary schools, established the various factors hindering the effective utilization of ICTs in education programmes in selected secondary schools and suggested possible remedies to the challenges which hinder ICT utilization in the selected secondary schools.

1.6.3 Time Scope
The study was carried out from the period November 2015 to May 2016.This is a period when ICT development was implemented in Ngongwe and Malongwe Senior Secondary schools in Buikwe District but to date it has failed to take off.

1.7 Significance of study
The findings of the study are expected to be useful to several categories of people/organizations in the following ways;

The findings are expected to be useful to the policy makers in the Ministry of Education and Sports and Ministry of ICT who are involved in designing and implementing ICT policies secondary schools as well as policy makers in Buikwe district on issues concerning ICT development and its sustainability in education.

Similarly, it is envisaged that the findings will be useful to implementers of ICT development in both private and government Secondary schools on the challenges and strategies to improve their problems regarding ICT development.

The main output of this study is hoped to add knowledge to already existing one on the influence of ICT development in education.

1.8 Definition of the key terms

ICTs are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. This involves computer hardware, software, Network connectivity, mobile telephones among others.

ICT for development is the use of information and communication technologies (ICTs) in the fields of socioeconomic development, international development, and human rights.

Education is the process of facilitating learning. Knowledge, skills, values, beliefs, and habits of a group of people are transferred to other people, through storytelling, discussion, teaching, training, or research.

1.10The study will be conceptualized in the conceptual framework below

Independent Variables   **Dependent Variables**

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┌─────────────────────────────┐                    ┌─────────────────────────────┐
│ - Internet connectivity     │                    │ -Improved Quality of        │
│                             │                    │ education                   │
│ -ICT maintenance and renewal│                    │ -Innovativeness             │
│ plan                        │                    │ -Employability              │
│ -Policy on sharing ICT      │───────────┐        │ -Technological              │
│ facilities within schools   │           │        │ advancements                │
│                             │           └───────▶│ -Improved equitable         │
│ -Ability of school          │           ▲        │ learning                    │
│ administrators to use ICT   │           │        │                             │
│ skills                      │           │        └─────────────────────────────┘
└─────────────────────────────┘           │
                                           │
                        **Moderating variables**
                        ┌─────────────────────────────┐
                        │ -Students' attitude         │
                        │ -Culture                    │
                        │ -School's policies          │
                        │ -ICT administration policy  │
                        └─────────────────────────────┘
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Source: Adopted from Bradley, (2006) and modified by the researcher.

From the conceptual framework above, ICT which involve - Internet connectivity, ICT maintenance and renewal plan, Policy on sharing ICT facilities within schools and Ability of school administrators to use ICT skills was seen if it is to implemented in selected secondary schools, the education programmes can achieve their goals which may include; -Improved Quality of education, Innovativeness, Employability, Technological advancements and Improved equitable learning and in the same way these cannot be achieved easily in that, the following has to present and they include; -Students' attitude, Culture, School's policies and ICT administration policy.

Conclusion

To lay a theoretical groundwork for the empirical part of this study, the researcher first gave an overview of theoretical approaches that seem to be of relevance to the field of ICT based learning. These are basically "Western" (as opposed to "African") approaches, but from study's point of

view, they are sufficiently general to also be applied to African education. They might, of course, need to be fine-tuned to African learning environments.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the related literature review that have been explored and studied both theoretically and empirically on the existing literature on the relationship between utilization of information communication technology and education programmes in institutions of learning in developing countries and elsewhere in the world and this was done in line with the specific objectives of the study in order to identify the knowledgeable gaps. It is important to note that the greatest part of the existing literature were the works of other scholars, opinions, suggestions who have written about the topic of the study or those who have addressed similar issues as those of the variable that was available in the study.

2.1 ICT usage in the teaching/learning programs in secondary schools

Mbah, (2010) articulates numerous perspectives in which technology is important in education. (Mbah, 2010) further argues that; (i) ICT enhances teaching and learning process in such a way that ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change; (ii) ICT enhances the quality and accessibility of education in a way that ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere through use of computers and internet; (iii) ICT enhances learning environment in a way that ICT presences in schools creates an entirely new learning environment that challenges students to adopt different skill so that to be successful. Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through; (iv) ICT enhances learning motivation in such a way that with a shift of curricula from "content-centered" to "competence-based", the mode of curricula delivery has now shifted from "teacher centered" forms of delivery to "student-centered" forms of delivery. ICT in education motivates learning through provisions of devises such as videos, television and multimedia computer software (Anguyo, 2013).

In Africa, most governments in the Sub- Saharan Africa (SSA) took initiative to install computer and other technology resources to enhance teaching and learning in schools (Mangesi, 2007). Until now, most Sub- Saharan Africa (SSA) countries including; Botswana, Mauritius, Nigeria, Senegal and Ghana have to some extent developed their national ICT policies. These policies provide the foundation upon which ICT both at the national level and at the educational sector level is set. In East Africa, all of the five countries namely, Kenya, Tanzania, Uganda, Burundi, Rwanda and South Sudan have developed a national ICT strategy at different times (Hennessy, 2010).

Due to its perceived importance in enhancing teaching and learning that can improve academic performance, studies have from time to time recommended methodology needed for effective utilization of ICT in education. UNESCO (2014) in its articulation of e-readiness as a framework for quantifying ICT in education across Asia, views e-readiness as involving: policy development, curriculum development, physical infrastructures, ICT infrastructures and teacher preparedness. Similarly, Bartlett et al (2013) proposed six innovative areas that are essential for the utilization of ICT in secondary schools. These are: Physical Infrastructure, ICT infrastructure, Teacher ICT and Pedagogical Skills and Knowledge, Open Source Teaching and Learning Resources, Student ICT Participation and Knowledge and -Public-Private Partnership Implementation (Kaahwa, 2013).

The use of ICT is making major differences in the learning of students and teaching approaches. Schools in the Western World invested a lot for ICT infrastructures over the last twenty years, and students use computers more often and for a much larger range of applications (Mikre,2012). Studies reveal that students using ICT facilities mostly show higher learning gains than those who do not use (Kulik, 2009). Though the chalkboard, textbooks, radio/television and film have been used for educational purpose over the years, none has quite impacted on the educational process like the computer. The computer is capable of activating the senses of sight, hearing and touch of the users. ICT has the capacity to provide higher interactive potential for users to develop their individual, intellectual and creative ability. The main purpose of ICT consists of the development of human mental resources, which allow people to both successfully apply the existing knowledge and produce new knowledge (Farrel, 2007). Compared to the traditional methods of teaching and learning for example using textbooks and class notes, ICT enhances students' academic performance in the following ways:

ICT in education promotes active learning in such a way that ICT in education helps in mobilizing tools for examination, calculation and analysis of information in order to provide a platform for student inquiry, analysis and construction of new information. The learners therefore, learn as they do and, whenever appropriate work on real-life problems in-depth. Moreover, ICT makes the learning less abstract and more relevant to their life situations. ICT in learning also promotes increased learner engagement (Mikre, 2009).

ICT in Education promotes collaborative learning in a way that ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modeling real world interactions, ICT-supported learning provides opportunity to work with students from different cultures, thereby helping to enhance learners teaming and communication skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning pace to include not just peers but also mentors and experts from different fields (Youssef &Dahmani, 2010).

ICT in education promotes creative learning in such a way that ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the duplication of received information (Kabir, 2013). ICT in education promotes integrative learning in a way that ICT-enhanced learning promotes a thematic integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice, which characterizes the traditional approach (Youssef &Dahmani, 2010).

ICT in Education promotes evaluative learning in a way that ICT-enhanced learning is student-directed and diagnostic. Unlike static, text or print-based education, ICT-enhanced learning recognizes the presence of different learning pathways to explore and discover rather than merely listen and remember (Mikre, 2011). ICT in education motivates students in a way that with a shift of curricula from "content-centered" to "competence-based", the mode of curricula delivery has now shifted from "teacher centered" forms of delivery to "student-centered" forms of delivery. ICT in education motivates learning through provisions of devices such as videos, television and multimedia computer software. Becker (2000) found that ICT increases student engagement, which leads to increased amount of time students spend working outside class time.

This study makes use of the teaching of Cognitive flexibility theory developed by Rand Spiro (Nickel, 2014). Spiro (2014) argued that learners' intellect can be stimulated by computer technology to spontaneously comprehend multiple concepts in response to the situational demand. This theory teaches that a learning environment that has computer technology facilitates learners to assimilate, retain, articulate, transfer and apply knowledge in areas of work (Obira, 2006). This theory is built on four principles; (i) learning activities must provide multiple representations of content; (ii) instructional materials should avoid oversimplifying the content domain and support context-dependent knowledge; (iii), instruction should be case-based and emphasize knowledge construction, not transmission of information; and (iv), knowledge sources should be highly interconnected rather than compartmentalized (Kearsley, 2000).

According to Obira, (2006) the theory largely concerns itself with transfer of knowledge and skills beyond their initial learning situation because behavioral change would likely occur for learners who learn the material presented in training and desire to apply that new knowledge or skills to work activities. The researcher chooses this theory because just as ICT in teaching and learning can stimulate learner's mind to grasp complex concepts and then apply at work place, in the same way, the same transfer of knowledge can be applied in examination which determines students' academic performance.

Take an example of how cognitive flexibility theory can apply in student's learning in history class. Basing on the four principles presented above, firstly, by encouraging students to use several sources to examine common themes that emerge from different perspectives of a history subject, there are multiple representations of content minus oversimplifying the content domain. Students can use multiple types of educational technologies, such as the internet, software packages, and communication tools, to search for multiple representations of the content. Secondly, students can be urged to construct knowledge through research, collaboration, and conversation among groups. This can be greatly enhanced by the use of various educational technologies. Thirdly, such a history unit allows students to revisit the historical content from many different perspectives and academic areas. Finally, the unit incorporates several subject areas and asks students to recognize the connection between the disciplines within the larger context of history. By doing this, students make the connection between information they learn in school and real life and can recognize that they are powerful elements in the learning environment. Again, students can use various types of

educational technologies (multimedia presentations, videos, web pages, etc.) to present their newly discovered connections related to the content (Spiro &Jehng, 1990).

2.2 Factors hindering the effective utilization of ICTs in education programmes in secondary schools

Mayette, (2010) points out that inadequate ICT infrastructure has been the biggest challenge that developing world face. These include hardware, software, connectivity, constant power supply among others. The school infrastructure is such a key component in determining the success of any project that carries on in schools (Ayeni&Adelabu, 2012; Ben et. al., 2006). If space, furniture and ambience are insufficient or unfit it is highly probable that ICT development for education will not succeeds. The technological aspects of security leave a lot to be desired in that if the systems are not secure they are prone to intrusion and misuse which may tantamount to abuse and profound legal implications (Huseyin, et al, 2014; Jon, 2006).

Although many schools have computers as a result of Government initiatives, NGOs, religious organizations, and international donors, few are connected to the Internet. Those that are in place are typically used for teaching basic computer skills and administrative purposes. Connectivity is much more prevalent in urban than rural schools, basically because access to ICT infrastructure for schools mirrors the national rural-urban divide. The more specific factors constraining connectivity in rural areas are the overall poor communications infrastructure, low electricity coverage, and high capital costs involved in setting up a computer laboratory (Uconnect and SchoolNet Uganda Report 2010).

Every project involves several key stakeholders among which are school management, surrounding communities, opinion leaders and learners. Such players require a keen level of involvement, without which they can easily fail the project; by rejecting or destroying it (Teddy, 2007; Tina, Albert & Ann, 2010; Victor, 2009; Wilson, 2003).School management support and involvement in ICT development in education has proved benefits of nurturing ownership and self-worthiness, sometimes counter fund contributions, from the community, security ideas, motivation and sustainability (Najjemba et. al,. 2012). Implementers of ICT Programmes for developmental must be aware that as ICTs diffuse in the lives of citizens, roles of individuals change both socially and psychology. Socially, citizens begin to get more involved in wider scope of interests like politics, education, communication beyond the immediate community, trade and others.

Psychologically citizens improve in self-esteem which can positively impact their contribution to community development as well as self-development (Bradley, 2006).

The Technology Acceptance Model cautions for constructive involvement of all beneficiaries in ICT developmental, well aware that there are causal linkages of between how communities perceived benefits from a new technology and their acceptance of the technology (Davis et al. 1989). Stakeholders in education need to effectively collaborate and contribute towards creating the infrastructure and environment which results in a conducive learning environment. Student participation in learning cannot be assumed. Deliberate strategy, planned intervention, formative assessment and group presentation are needed to increase their participation maintenance and sustainability of the project (Dart, 2006; Rozendal, 2003).

Information and Communication Technology for Development (ICTD) have faced a high failure rate, partly due to poor planning, poor project design and poor management. Failure of ICT for development at the world level has been linked to; lack of clarity about roles, responsibilities and requirements, lack of definitions and managing project requirement and failure to communicate these from project sponsors, poor design and implementation among others (Ritter, 2007). Lack of awareness about any project benefits, mindset and fear of beneficiaries, lack of clear process and lack of clear perception have been cited as some of the key reasons for failure of ICT programs and projects in Education in Africa (Tususbira et. al., 2001). Also lack of funding for ICT projects, poor network infrastructure and unaffordable ICTs, have been cited as the key challenges to Uganda ICT successful implementation of ICT projects (Rwangoga &Baryayetunga, 2011).ICT projects should not be designed as a self-sufficient unit but rather as a process interaction with the environment within which it is being implemented.

Janassen (2011) emphasizes that ICT integration in education should parallel with teachers professional development. The school leadership also plays a key role in the integration of ICT in education through organizing refresher courses and training of staff in ICT related courses to ensure that teachers are acquainted with the current and relevant technology. Thus, for the effectiveness of ICT integration in education, administrators must be competent and have broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education (Hermes, 2012).

Furthermore, learning content and language also challenge the integration of ICT in education. Content development is a critical area that educators overlook. In integrating ICT in education, we have to care for the relevance of the learning content to the target groups. With respect to language, English is the dominant language in many of educational software, while English language proficiency is not high in many of the developing countries, and this is one barrier in the integration of ICT to education (Heeks, 2009).

Another great challenge is the financing. ICTs in education programs require large capital investment and developing countries need to predict the benefit of ICT use to balance the cost relative to the existing alternatives. Potential sources of money and resources for ICT use programs suggested are grants, public subsidies, fund-raising events, in kind support from volunteers, community support, revenues earned from core business, and revenues earned from ancillary activities (Mungai, 2012). And in most cases, these sources usually stop their support after the provision and installing the computers and the burden remains with the school administration to ensure their maintenance, updates and security.

Kok (2007) however commented that though computers are a means of development education as they alleviate the students' need for teachers, textbooks and resource materials through supporting student focused education and can improve learning and teaching if one understands the available technology for education, computers are not a panacea of educational problems. Strauss (2012) asserted that Uganda may not solve its educational problems by acquiring and use of computers as they are other factors that can affect educational standards in the country as well driving factor for the country's development. This involves poverty levels among others.

Policy makers and project leaders should think in terms of input factors that can work together to observe the right impact of ICT in education. Matching the introduction of computers with national policies and programs related to changes in curriculum, pedagogy, assessment, and teacher training is more likely to result in greater learning of students and other out comes (Kozma, 2005). OECD's report (2002) emphasized the need to identify and evaluate what education policy makers might do to better use ICTs in achieving improved educational out comes. Policies ought to focus on the requirements that ensure investment in ICTs development in education leads to positive educational out comes by understanding how ICT can contribute to greater access to learning; to higher quality teaching and to improved and more equitable learning out comes.

ICT policies should also reflect on issues such as institutional frameworks for school management; the regulatory structures for educational institutions and teachers' work arrangements. The need for linking ICT to education policies requires recognition and appreciating the importance of technologies, (UNDP, 2004). Hence the five distinct development areas for the use of ICT policy to be underlined are investigation and development of appropriate ICT solutions, deployment of ICT, maintenance and support of ICT, ICT literacy, and ICT integration.

According to Tinio (2010) human resource capacity development is critically important for ICT development in Education. Human resource capacity development ought to be recognized in policy documents as paramount thus schools need to address and support training needs of teachers in ICT related courses for efficiency and effectiveness. Schools need to develop competencies of teachers and school administrators for the successful integration of ICT in the education system in order to bridge the skills gap of people implementing it. For instance, teachers need professional development to gain skills with particular applications of ICT, integration into existing curricula, curricular changes related to its use, changes in teacher role and underpinning educational theories such as constructivism/or student-centered learning. Because of this, any attempt of ICT integration in education should parallel with teachers professional development.

Teddy (2007) notes that few teachers have the skills to make pedagogical use of ICTs for teaching across the curriculum that will enable them skillfully redesign learning environments so that students can transfer their newly gained ICT skills to other applications to use in an ICT rich environment. The school administration should allocate resources towards training of teachers in ICT skills as well as the infrastructure so that they can ably apply the skills acquired appropriately.

Government and school administration ought to organize adequate fiscal resources for proper implementation of ICT strategy in schools. ICTs in education programs require large capital investment and there is a need to predict the benefit of ICT use to balance the cost relative to the existing alternatives. The resources should basically be focused on the acquisition of infrastructure that is computers, network infrastructures and connections, appropriate buildings and rooms to house the technology, constant electric supply and telephone lines, and lack of the different types of ICTs. Potential sources of money and resources for ICT use programs suggested are grants, public subsidies, fund-raising events, in kind support from volunteers, community support,

revenues earned from core business, and revenues earned from ancillary activities (UNDP Report 2004).

Tina, Albert &Ann (2010) assert that education policies have to reflect alternate and new teaching paradigms that ICT can offer in terms of providing a more effective, relevant, and flexible mode of learning for the underprivileged and the general masses. He stressed the need to design the learning content for local educational content that is relevant, cultural acceptability and usability to the country's context. Learning models that combines the face-to-face classroom practice with e-learning solutions should be incorporated in schools curriculum to facilitate student's learning in class contact and uses the modular object oriented dynamic learning environment to facilitate out of class learning. In the same vein, Moss (2012) argue that appropriate ICTs medium ought to be designed to deliver content and be able to define and describe for what purpose the content will be used and also be very clear as to what delivery system we are going to use. Such a decision should not be based on the technologies but on the conditions and contexts in which we seek to use the ICTs; e.g. access to media by the learners, etc.

Knezek and Christensen (2002) stated that teachers' competence with computer technology is a key factor of effective use of ICT in teaching. So, the teachers who do not have ICT competence could not integrate the ICT tools in their teaching. Some other research studies such as Albalat&Tarrago, 1995; Braak, 2001; Chu, 2000; Hodgson, 1995; Vanderlinde, Braak&Hermans, 2009; Venezky, 2004 also agreed that effective use of computers is reliant on the teachers' ICT skills as well as their intentions towards ICT use (Divaharan and Ping, 2010). Divaharan and Koh (2010) also claimed that teachers' professional development has to concentrate on both ICT skills training and appropriate ICT integration strategies in the curriculum. Therefore, the teachers need knowledge of appropriate ICT integration approaches and ICT skills to successfully incorporate the ICT tools into their lessons.

According to Jones (2012), inappropriate training styles that lack pedagogical aspects are likely to be unsuccessful, so that high levels of ICT use by teachers are not achieved. A recent case study done by Unal and Ozturk was interested in social studies teachers in Turkey and aimed to investigate the barriers to ICT integration into their classroom practices. The authors found that only 6 teachers out of a total of 18 reported that they had received in-service ICT training. These 6 teachers also stated that the ICT training that they received was ineffective due to the absence of

the pedagogical aspects. Unal and Ozturk (2012) (p. 942-943) therefore concluded that: *"Another related problem is that the training given about ICT is mostly for general knowledge and skills. Interviewed teachers state that the in-service training they received did not include generally ICT-based methods and approaches for teaching social studies. Within the scope of in-service training only general skills of using ICT equipment were emphasized, without relating them to teaching methods and content knowledge."*

Inaccessibility or unavailability of ICT, a school-level barrier, has been identified as a key obstacle that impedes teachers from using it in teaching. Thus, this factor has interested an enormous number of researchers. Shortage of resources includes different factors, such as lack of access to hardware and software, poor quality hardware and inappropriate software. In its statistical analysis report, the National Centre for Education Statistics in the United States of America found a positive correlation between the availability of ICT in the classroom and the likelihood of teachers assigning home work that required the use of ICT by students.

Alev (2013) believes that offering plenty of resources can lure and persuade teachers to use them whilst teaching. According to Mumtaz (p. 336), "Limited resources within schools are a great impediment to the take-up of ICT. Lack of computers and software in the classroom can seriously limit what teachers are able to do with ICT." In 2002, the British Department for Education and Skills launched the "Laptops for Teachers" initiative that aimed to provide laptops to selected teachers on long term loan. This initiative's main goal was to increase teachers and head teachers' access to computers. The evaluation of the first year of this initiative showed that since receiving their laptops, the teachers had become more likely to integrate ICT in their teaching and guide students' ICT use. Furthermore, the teachers Furthermore, the teachers highlighted that they had become more confident when using ICT and they also became familiar with new software packages. In the 2013 report for Becta by Cox et al. called 'ICT and pedagogy: A review of the literature', it was emphasised that most teachers were less likely to buy their own ICT tools; instead, they would prefer to use the technological tools that were made available for them.

In Saudi Arabia, integrating technology in schools is limited due to lack of hardware and unavailability of Internet access during the school day. The majority of the teachers who participated in Al-Rashed's research reported technology unavailability as one of the major obstacles and challenges that impede educational technology integration. The results also indicated that many schools in Saudi Arabia have only a small number of computers that are subsidized by the teachers' own subscriptions.

Al-Showaye, (2011) wanted to assess computer and Internet facilities in intermediate and secondary schools in Saudi Arabia in order to investigate the extent of the current use of ICT, and to identify the barriers that hinder teachers from using it. For this purpose and others, he administered a survey of 143 teachers and 686 students from 29 public and private schools of both intermediate and secondary stages in Al-Qasseem region in Saudi Arabia. He also interviewed 10 teachers and 18 students drawn from the questionnaire sample. The analysis of these data demonstrated 16 barriers to ICT integration, including inadequate numbers of computers available for intermediate and secondary teachers.

Al-Saif (2014) added the lack of Arabic educational software to the barriers already cited. In a study that was carried out by Almaghlouth and focused on Saudi secondary school science teachers' perceptions of the use of ICT tools to support teaching and learning, participants highlighted the lack of a suitable place for ICT integration such as a resources room and a laboratory fully equipped with the latest technologies. Oyaid (2013) studied secondary students' perceptions of ICT and their usage of it inside and outside schools in Riyadh. The students who participated in her study reported that their teachers did not use technology frequently. Oyaid explained that this result related to her finding that more than half of all students said that computer facilities in school were insufficient.

Several studies found that teaching experiences and age influence the successful use of ICT in classrooms (Wong & Li, 2008; Giordano, 2007; Hernandez-Ramos, 2005). Similar findings can be found in research carried out by Gorder (2008) which was reported that teacher experience is significantly correlated with the actual use of technology. She discovered that effective use of computer was related to technological comfort levels and the liberty to shape instruction to teacher-perceived student needs. Accordingly, 3 teachers (25%) indicated that their age and teaching

experiences were the barriers to adapt to the ICT integration into their lessons. The older teachers with more experience in teaching did not prefer to use ICT tools in their English classes. The teachers explained.

On the other hand, unless the trainees are ICT literate, including the technical aspects of ICT in a training programme is still important. For instance, Preston et al. (2015) asserted the need for training in specific ICT skills, especially skills in solving technical problems and understanding the basic workings of the technology, and they provide evidence that the breakdown of equipment prevents teachers from using ICT. It is also found that teachers who were ICT beginners were more likely to prefer to learn ICT basics first and then later to be involved in pedagogical training. Moreover, Cunningham et al. in their research on the 'Laptops for Teachers' initiative indicated that the teachers who received a laptop would need to be trained to use it properly, especially with regard to the other ICT tools.

The problem of lack of effective training is reported by many Saudi researchers and other Arabic researchers as a major obstacle to using technology properly in classrooms. Al- Omar (2013) clearly summarized the problem of technology in Saudi primary schools, stating that the majority of primary teachers graduated before the introduction of computers in schools; therefore they are computer illiterate. Waiting for another generation of teachers who are computer literate to start using technology in primary schools is impossible. Thus there is a real need for in-service training for teachers in primary schools. Despite the fact that the present study is interested in novice teachers with a maximum of five years' teaching experience, this does not necessarily mean that they are literate regarding using technology and related pedagogies. This is because education colleges in Saudi universities do not pay great attention to training student teachers in using educational technology. Al-Joudi (2013) examined computer experience, computer knowledge and computer training needs of Saudi Arabian Teacher Colleges' staff and students in five regions.

Many studies from different parts of the world have found similar results to Becta's. For instance, in the review by Hew and Brush (2014) of the literature of the period from 1995 to Spring 2006 made on the barriers to adopting ICT in education and the strategies to overcome them in both USA and other countries, they found that teachers need a very long time to surf the Internet to find different resources for their projects. Kula (2011) found that the barriers that teachers have in Turkey are very similar to those worldwide. These barriers are shortage in time needed to prepare

their teaching resources as well as shortage of time for attending adequate ICT training. Khan et al. reported that Bangladeshi teachers have a heavy workload and thus they lack time that is necessary to prepare technology materials, attend training and plan how to integrate it into their curriculum.

In Cyprus, Vrasidas et al, (2013) carried out a survey on 10 high schools and 14 primary schools, to explore the challenges and the opportunities that teachers have to deal with when they use ICT. More than half of the teachers (71.7%) reported lack of time in the classroom as a key barrier to ICT integration while 60.4% reported lack of time needed to prepare ICT-based activities as a main barrier. Similarly, in Hong Kong, Wong conducted a study of primary heads and teachers to investigate their perspectives on the implementation of ICT. His data show that teachers could not integrate ICT into their teaching because they lack time for planning and preparing, regardless of whether or not they were willing to use it. On the other hand, one of Becta's reports written by Scrimshaw, which was about the enablers that help teachers to make successful use of ICT, suggested allowing sufficient time for teachers to plan and prepare as a key factor that could enable better use of ICT in secondary schools.

2.3 Remedies to the challenges which hinder ICT utilization in secondary schools
According to the Edinburgh ICT Self Evaluation Framework (2012), the effective and appropriate use of ICT, both in the classroom and beyond, can enhance the learning experience. By including ICT in all curricular areas, learners will benefit from greater personalization and choice, resulting in improved learner engagement and outcomes. The Edinburgh ICT Self-Evaluation Framework was thus created to provide a structure for reviewing establishment's on use of ICT and its impact on school improvement. By using this framework schools are able to engage in a reflective professional process that helps identify the way forward in embedding ICT throughout the curriculum, informing overall strategy and improving their plans.

The Edinburgh ICT Self Evaluation Framework has five areas of evaluation: Leadership and Management, Planning, Learning and Professional Development, Resources. Regarding leadership and management, this framework evaluates ICT and the school vision, the strategy to achieve the vision (strategic leadership of ICT across the whole school, the quality of the strategy, safeguarding) and management of information i.e. communication strategy. Regarding planning, the framework evaluates whole school planning (planning the use of ICT to support learning and

teaching and planning for ICT as a means of promoting inclusion). The framework also evaluates curriculum leadership in relation to learning and teaching with ICT.

Regarding learning, this framework evaluates teaching and the learning process (the extent of ICT use for learning and teaching, quality of use of ICT for learning and teaching, learning with ICT beyond the school and ongoing critical evaluation). It also evaluates pupils' learning experiences in relation to pupils' progress more widely, effective and safe use of digital resources and learning skills. Regarding professional development, this framework evaluates planning for professional development (identifying whole school and ICT development needs, identifying individual staff skills and needs), implementation (meeting school and individual ICT needs, developing and sharing ICT practices, and review (impact of professional development activities). Regarding resources provision, this framework evaluates (sufficiency, suitability and availability of hardware) and management of ICT resources more so the technical Support.

NCCA, (2007) developed a framework that aimed at helping schools to develop students' ICT literacy by promoting the use of ICT that enrich teaching and learning in lower education. The framework emphasized four sets of activities teachers have to undertake to make students effective learners and users of ICT. The areas include: (i) creating, communicating and collaborating to organize and produce information, (ii) understanding and applying knowledge of the function of ICT including safe practice and maintenance,(iii) using ICT for thinking and learning including managing enquiry, assessing information, solving problems and expressing ideas across a range of curriculum areas and (iv) developing a critical appreciation of the role of ICT in society and habits which reflect ethical and responsible use of ICT.

UNESCO Institute Statistics (UIS) is a United Nation's repository for statistics on education, science and technology, and culture and communication. In executing its mandate of administering international data collections on the availability, use and impact of ICT in education, in 2014 it conducted a comparative study on ICT integration and E-Readiness in Schools in Asia. The analysis aimed at looking at four specific types of data: i) use of ICT in policy and key curricular areas; ii) ICT infrastructure and its importance to integrating ICT-assisted instruction; iii) participation in programs offering ICT; and iv) teaching and learning as they relate to ICT in education.

According to UNESCO (2014), since policymakers are in a unique position to bring about change, they should make an explicit connection between the innovation and national policies that promoted the use of ICT. These policies must not only be formulated but fully implemented. Policymakers should not make policies that can fail to succeed particularly when: i) they are viewed as mere symbolic gestures; ii) teachers actively resist policy-based change that they see as imposed from the outside without their input or participation; iii) they do not have explicit connections to instructional practice (e.g. focus on hardware rather than their relationship to pedagogy); iv) they do not provide teachers with an opportunity to learn the policies and their instructional implications; and v) there is a lack of program and resource alignment to the policies' intentions. According to UNESCO (2014), there is also need for early integration of ICT into primary and secondary curricula through formal recommendations to ensure the introduction and implementation of ICT into educational institutions and classrooms.

According to UNESCO (2014), to support teaching and learning, as well as improve overall education management, a variety of ICT-assisted instructional approaches may be implemented, ranging from the use of radio or television to computers, internet and newly-emerging mobile devices. While newer battery-operated ICTs are emerging, in addition to mobile devices that may be recharged off-site, the majority of ICTs including television, computers and the Internet continue to require a more stable energy source. To summarize, the integration of ICT into schools require electricity (e.g. grid/mains connection, wind, water, solar or fuel-powered generator, etc.) that is regularly and readily available. These are supported by well-built ICT laboratories.

Teachers are frequently considered to be the most important influence on classroom learning and, as such, play an invaluable role in ensuring that pupils use ICT effectively inside the school. Teacher training is for example significant in ICT use in education and must be given attention. UNESCO ICT Competency Framework (2011) for teachers developed a framework comprising of (i) technology literacy: which aims at increasing the extent to which new technology is used by students, citizens and the workforce by incorporating technology skills into the school curriculum (Technology Literacy approach); (ii) knowledge deepening which aims at increasing the ability of students, citizens, and the workforce to use knowledge to add value to society and the economy by applying it to solve complex, real-world problems (Knowledge Deepening approach); (iii)

increasing the ability of students, citizens, and the workforce to innovate, produce new knowledge, and benefit from this new knowledge (the Knowledge Creation approach).

Skills and Knowledge involves engaging teachers in ongoing, practical professional development facilitated through partnerships with local universities and/or NGOs, providing capacity-building to teacher trainers from local universities and/or NGOs, observing classrooms regularly to encourage and support increasing use of learner-centered methods and integration of ICT (Bartlett et al, 2013).Open Source Teaching and Learning Resources involves leading teachers through the exercise of locating relevant online resources and uploading to the Connect To Learn Online Resource Library, expanding the availability of quality online resources for secondary teachers in collaboration with African faculties of education (Bartlett et al, 2013).

Student ICT Participation and Knowledge involves encouraging teachers to assign online research or information presentation assignments that utilize Libre Office software to their students, encourage both students and teachers to use the computers for education-related purposes only in order to conserve airtime (Bartlett et al, 2013). Public-Private Partnership Implementation involves hiring local facilitators in each site to provide ongoing professional development and support to administrators and teachers, Forge partnerships with in country Faculties of Education and Telecommunications Industry leaders to institutionalize the integration of ICT at the tertiary level, Deepen partnerships within the Telecommunications industry to provide infrastructural and program support to the schools (Bartlett et al, 2013).

In 2010 *Info Dev* carried out research on *ICT in School Education (Primary and Secondary)* with the intention of providing information on trends and dominant features of the use of ICTs for school education, identifying challenges in the effective implementation of ICTs in school education and providing suggestions to address these challenges and aid the implementation of ICTs in school education. *Info Dev* (2010) observed that international trends in application of ICTs in schools indicate that it is directly related to the development of schools and the teaching and learning environment. This study however noted that there are challenges in implementing ICTs effectively in existing schools such as language barrier, limited finance to provide ICT in schools and low teacher skills. Therefore, in order to more effectively prepare students to participate in ICT-driven education, greater commitments and willingness to share and adopt innovative

solutions are needed from all aspects. ICT driven education involves commitment and support from government, the private sector, the communities, donors, teacher, parents, and students.

Government: The government as argued by Ndawula (2013) through its agencies like parliament and ministry of education sets up policies to govern ICT use, train teachers, reviews the curriculum, deploys teachers, provide security and carries out assessment and supervisions. The government also provides funds, electricity supply, and monitors ICT imports tariffs. Amuriat (2012) also contends that the government leads the policy formulation process, review, approves and harmonizes ICT sector issues. In Uganda, the parliament approved ICT policy to be used in education in 2005. In secondary sub-sector, the aim of ICT policy is that secondary teachers should be equipped to make use of ICT in their lesson preparation. The policy also tasked the government to provide ICT infrastructure in each institution (Uganda, MoES Internal Report on ICT, 2009).

Consequently, according to Kasse & Bulunywa (2013), the MoES has also supported other ICT initiatives in partnership with other agencies. Notable among these are School Net, the Microsoft Partners in Learning Program, Connect-ED, Curriculum Net, NEPAD e-schools initiative, Cyber-Schools Technology Solutions (CSTS) program and Computers for Schools- Uganda. These initiatives have focused on equipping of schools with computers and associated hardware / software, provision of internet connectivity, training of teachers and teacher educators in ICT, and the development / selection of digitized pedagogical content. Some such as the Microsoft Partners in Learning Program are quite ambitious; this initiative has already equipped 100 schools with donated PCs and the plan is to have all (8000) secondary schools equipped with computers and training modules by the end of 2015 (Hennessy et al (2010).

2.4 Summary
The place of information and communication technology in education and training can be overemphasized as its full integration in education helps to ensure quality education in various levels of education such as primary, secondary and tertiary. Also, most scholars strongly feel that ICT is the most valuable tool to overcome the problem being faced in the teaching-learning process. ICT has become a major key tool in acquiring, processing and disseminating adequate knowledge as well as an imperative tool for measuring development of a nation. Today, the academics are now being challenged by the rapidly growing new information technologies of multimedia, internet, WWW and other virtual computer technologies which demand changes in

the styles, attitudes and skill towards information handling and dissemination. The literature highlighted a number roles for ICT use in education ranging from enhancing quality and equitable learning, innovativeness and creativity though developing countries still face challenges of inadequate ICT infrastructure, lack of skilled personnel in ICT skills, limited finances and lack of learning content among others. Numerous strategies of improving ICT for development including designing policies that align with the technology, good planning, staff capacity development. The literature however shows that ICT for development in education is not a panacea of education's problems as it requires a cohesive system that will see education improved as a whole. Also, literature did not point out the appropriate ICTs medium to deliver content and the delivery system.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used during the study. It involved the Research design, study population, sample size and selection, sampling techniques, data collection methods, Data collection instruments, procedure of data collection, Reliability and validity of instruments, Data analysis plus measurement of variables.

3.2 Research design

 The study used a case study research design which involved experimentation, observation, surveys and archival information (as mentioned above) each suited to a certain type of research problem, degree of experimenter control over events and historical/contemporary perspective and focus. A case study usually takes as their principal subject selected examples of a social entity within its normal context. The case study compliment the objective and research problem in that it provides descriptive accounts of the role of Information Communication Technology(ICT) the learning/teaching, yet can also be used in an intellectually rigorous manner to achieve experimental isolation of one or more selected schools within Buikwe District

3.3 Study population

In this study, the target population was drawn from Buikwe District and included those involved in or with knowledge about the study variables and Buikwe District divided within four (4) categories comprising of the following: Head teachers within the selected schools (30), officials from Buikwe District (10), District Councilors (30), students and other authorized persons (280). The Head teachers within the schools were targeted because they are directly involved and oversee the implementation of ICT education among Buikwe District Schools. They manage the schools, handle government grants to the schools, supervise teachers and monitor the entire progress in delivering the service.

The officials from Buikwe District were targeted because they participate in planning, budgeting and reviewing activities pertaining ICT implementation of secondary Education services at the District level during their Technical planning committee meetings conducted monthly. The study targeted District Councilors because they are the District policy makers and oversee ICT implementation government programmes inform of monitoring and evaluation. Finally other authorized persons like school management committees, students were also targeted since they are involved in general planning, through participatory involvement of bottom up planning and they are beneficiaries.

3.4 Sample size and selection

In this study, the number of individuals in their targeted population was known in advance as lists indicating the members are readily available at Buikwe District offices and is exhaustive. The respondent categories comprised of both sexes but of different marital status and age group. The ultimate sample size of 228 respondents was derived from the target population of 350 respondents based on sample table developed by Krejcie and Morgan (1970) cited in Amin (2005), (Appendix C).

3.5 Sampling techniques

The study used both purposive and simple random sampling techniques. A sample of 228 respondents was selected. In selecting the respondents groups, purposive was used on the second category of respondent who are officials in the district public service since the entire accessible population (target population) was used as respondents. Simple random sampling was used to other respondent categories that is; Head teachers from Buikwe District Schools, Councilors and other authorized persons because respondents had equal chance of being selected.

Table 1: Category, target population, sample size and sampling technique that was used in the study

Category	Target Population	Sample size	Sampling Techniques
Head teachers within Buikwe District	30	28	Purposive sampling
Officials from Buikwe District	10	10	Purposive sampling
Deputy head teachers and Teachers	30	28	Simple random sampling
Students	280	162	Simple random sampling
Total	**350**	**228**	

Source: Buikwe District Education Department, Annual Report 2011.

3.6 Data Collection Methods

Data for the research was collected using three methods. These included self-administered questionnaires; focus group discussion and documentary review. Self-administered questionnaires and focus group discussion were used since it enabled the researcher obtain firsthand information from the field. Data was obtained from respondent categories indicated. The type of data included; social demographic characteristics of the respondents (age, gender, level of education etc), perceptions about the study variable etc. Documentary review enabled the researcher obtain information on already existing literature about the role of Information Communication Technology(ICT) the learning/teaching in the selected secondary schools. This information was collected from reports, circulars newspapers, Magazines and internet.

3.6.1 Questionnaire survey

A self-administered questionnaire was used in the study and targeted all respondents. Mugenda and Mugenda (2005) states that questionnaires are used to obtain vital information about the population and ensure a wide coverage of the population in a short time. In addition Sekaran (2003) states that questionnaires are an efficient data collection mechanisms where the researcher knows exactly what was required and how to measure the variables of interest. He further asserts that administering questionnaires to number of interest simultaneously was less expensive and time consuming and does not require much skill to administer as compared to conducting interviews. Closed ended question were used with detailed guiding instructions as regards the manner in which

respondents were required to fill them independently with minimal supervision. Closed ended questionnaire were pre-coded answers according to themes from which respondents were asked to choose the appropriate responses. Respondents were given ample time to fill and return questionnaires later when they are through.

3.6.2 Focus Group Discussion (FGD)
This method was used to collect information from other authorized persons respondent category only and this was used to cross validate information got from questionnaires. The meetings for the respondents under this category were arranged in groups of fifteen to twenty (15 – 20) respondents comprising both men and women and were included: Parents, School Management Committee members, Parents Teachers Association members, Local Council leaders, for purposes of effective research facilitation and respondent participation.

This method was also enabled participants to hear from each other's response and make additional comments. It therefore enabled the researcher to get highly interactive sessions of interview in which objectivity and subjectivity of were got and it facilitates collecting data in a social context.

3.6.3 Documentary reviews
The study also involved carrying out library and office research where secondary sources about the research questions were considered.

This include related literature on annual and quarterly education progress reports, budgets, newspapers, ICT implementation guidelines, internet, circulars policies and regulations of government. Established libraries and record offices were visited like: Makerere University library, Buikwe District Council Public Library and Buikwe District, Council Offices. This will were useful to cross validate primary data and provide basis for explaining certain concepts.

3.7 Data Collection Instruments
The data collection instruments included; structured questionnaires, focus group discussion check list and documentary review check list.

3.7.1 Structured questionnaire
The researcher used close ended questionnaire for all respondents. The use of questionnaire enabled the collection of data from a large number of respondents and also enabled respondents give sensitive information without fear as their personal identity were not needed on the

questionnaire. This supports Amin, 2005 (P.270)'s contention that questionnaires Offer greater assurance of anonymity thus enabling the respondents to give sensitive information without fear.

Rensis Likert's scale statement having five category response continuum of 5 – 1 were used where I meant "strongly disagree", 2 meant "Disagree; 3 meant "No comment" 4 meant "Agree" and 5 meant "strongly agree" with assertion. This was designed to establish the extent to which respondents are in agreement with statements and it was used to measure the variables under study. In using this, each respondent were selected a response most suitable to him / her in describing each statement and the response categories were weighed from 5 – 1 and average for all items were computed accordingly.

3.7.2 Documentary review checklist
Documentary review checklist containing a list of documents to be reviewed was used and this provided necessary data for the study.

The documents for review were obtained from libraries, l Council Offices, plus internet. They included; reports, newspapers, policies and regulations ICT guidelines, annual final accounts, Budgets and circulars.

3.8 Research procedure to be used in data collection
After the research proposal was approved and passed together with the research data collection tools, the researcher obtained a letter from the Faculty of Science, granting permission to proceed with data collection and presented it to Buikwe District authorities, for acceptance and authorization to undertake the study in their local government.

The authorities' permission to the researcher was of great significance in clarifying and averting suspicion about the study and helped to elicit increased willingness on the part of respondents to be objective and honest while responding to questions posed to them. The letter introduced the researcher as a participant of UMU and explains the importance and purpose of the research. In addition the letter requested for assistance to be offered to the researcher. The researcher recruited one research assistant to ensure that the influence of personal factors of the research during data collection are minimized by bringing on board a person who was neutral about the research variable relationship and the selected organization of the study. The research assistant also helped in translating the questionnaires into the local language especially among other authorized persons respondent category with low level of education. The researcher trained the assistant for three

days before going to the field to ensure quality work. The researcher made contact with the various authorities where the study was carried out and together they made appointments when to carry out the study. This approach enabled proper planning and mobilization of resources on the agreed dates. The researcher together with the assistant went to the respondents and collect data.

The researcher ensured that during data collection, questions were discussed in the presence of respondents in order to be well understood and where necessary make adjustments to reduce chances of non-compliance and non-reliability of the tool.

3.9 Validity and Reliability of Instruments

3.9.1 Validity

Validity refers to the degree to which results obtained from analysis of the data actually represents the phenomenon under study. The validity of the research instrument was determined by pretesting. Mugenda and Mugenda (2005) assert that pre testing ensures clarity and accuracy of results so that data collected gives meaningful, reliable results representing variable in the study. Pre-testing helped to estimate the time needed to take, to fill the questionnaires, pre-testing were done by administering to ten (10) respondents within the study population but outside the sample. Questionnaires were scrutinized by five colleagues at Uganda Management Institute for their peer opinion on content and accuracy. Results from the field and opinion of colleagues will help identify gaps and make modifications to the instruments where necessary. The supervisors will also be notified accordingly.

In calculating validity the researcher ensured that questions are relevant in order to ensure that data collected give meaningful and reliable results represented by variables in the study (Mugenda and Mugenda, 1999). The researcher used the following formula to establish validity of the research instruments as seen below.

Content validity Index (CVI) = Agreed items by all judges as suitable
                                          Total number of items judged.

If the overall Content Validity Index (CVI) of the instrument is equal to the average acceptable Index of 0.7 or above, then the instrument will be accepted as valid (Amin 2005)

3.9.2 Reliability

According to Mugenda and Mugenda (1999) reliability refers to the measure of the degree to which a research instrument yields consistent results or data after repeated trials. Cronbach's Alpha coefficient will be used to measure reliability of the instruments.

Accordingly to Amin (2005), an alpha of 0.5 or higher is sufficient to show reliability; the closer it is to 1 the higher the internal consistency in reliability (Sekaran 2003). The questionnaire were pre tested using ten (10) respondents within Buikwe District and the reliability results were computed using the statistical package for social scientists (SPSS) and the scores were evaluated as below:

Overall = Total number of alpha output divided by no of variables.

Total number of items = Summation of number of item for all the variables.

3.10 Data analysis

3.10.1 Quantitative data analysis

The quantitative data involved information from the questionnaires only. Data from the field was too raw for proper interpretation. It was therefore vital to put it into order and structure it, so as to drive meaning and information from it was be entered into the Computer, checked and statistically analyzed using the Statistical Package for Social Scientists (SPSS) software package to generate descriptive and inferential statistics Descriptive analysis was applied to describe the primary variable and associated indicator items related to the study objectives.

The results were presented inform of tables and charts then discussed in relation to existing literature. Conclusion and recommendations were drawn in relation to the set objectives of the study.

3.10.2 Qualitative data analysis

Qualitative data was collected using focus group checklist during discussions with other authorized persons respondent category in meetings and documentary reviews using documentary checklist. Content analysis was used to edit the data and re-organize it into meaningful shorter sentences.

The data was analyzed and organized based on patterns, repetitions and commonalities into themes based on the study variables. The data then was used to reinforce information got from questionnaires to draw conclusion and recommendations.

3.11 Measurement of variables

The variables of the study were measured using the five linket scale. Different variables were measured at different levels.

The variables were measured at nominal and ordinal scale. The nominal scale measurement was used in the first part of the questionnaire (demographics) which comprised items with some common set such as sex, age, marital status, designation and level of education of respondents.

According to Mugenda and Mugenda (1999), nominal scales are assigned only for purposes of identification but do not allow comparisons of the variable being measured.

The researcher used ordinal measurement which categorizes and ranks variable, being measured like uses of statements such as strongly agree, agree, no comment, disagree and strongly disagree (Amin 2005). The numbers in the ordinal scale represented relative position or order among the variable (Mugenda and Mugenda 1999: Amin 2005). Both nominal and ordinal scales were used to measure discrete variables and only the specified numbers such as 1, 2, 3, 4, and 5 was applied (Amin 2005, P. 11).

3.9 Limitations of the study

In the process of carrying out this investigation, a number of limitations were met. These limitations obstructed the speed at which the study was carried out. These included;

Some targeted respondents were not willing to set aside time to respond to the investigator's questions ended up frustrating the researcher's efforts to collect substantial data. The researcher also faced by a problem of some rude and hostile respondents.

The study required a lot of time to be dedicated to collecting substantial data from one respondent to another making observations, continuous review of literature, data analysis and report writing.

3.10 Ethical considerations

It was important during the process of research for the researcher to make respondents to understand that participation is voluntary and that participants are free to refuse to answer any question and to withdraw from participation any time they are chosen.

Another important consideration, involved getting the informed consent of those going to be met during the research process, which involved interviews and observations on issues that may be delicate to some respondents. The researcher undertakes to bear this seriously in mind.

Accuracy and honesty during the research process was very important for academic research to proceed. A researcher treated a research project with utmost care, in that there was no temptation to cheat and generate research results, since it jeopardizes the conception of the research.

Personal confidentiality and privacy was very important since the thesis was not public. If individuals had been used to provide information, it was important for their privacy to be respected. If private information had been accessed then confidentiality had to be maintained (Stephen, P. 2002). All respondents therefore, were re-assured of this before being involved.

Conclusion

The above describes how the study was conducted as it portrays the type of research design, study population, sample size and selection, sampling techniques, data collection methods, data collection instruments, procedure of data collection, reliability and validity of instruments, data analysis plus measurement of variables.

3.11 Summary

The study used a case study research design which involved experimentation, observation, surveys and archival information. The respondent categories comprised of both sexes but of different marital status and age group. The ultimate sample size of 228 respondents was derived from the target population of 350 respondents based on sample table developed by Krejcie and Morgan (1970) cited in Amin (2005), (Appendix C). The target population was drawn from Buikwe District and included those involved in or with knowledge about the study variables and Buikwe District divided within four (4) categories comprising of the following: Head teachers within the selected schools (30), officials from Buikwe District (10), District Councilors (30), students and other authorized persons. The study used both purposive and simple random sampling techniques. Data for the research was collected using three methods. These included self-administered questionnaires; focus group discussion and documentary review. Data was statistically analyzed using the Statistical Package for Social Scientists (SPSS) software package to generate descriptive and inferential statistics Descriptive analysis was applied to describe the primary variable and associated indicator items related to the study objectives. And one of the limitations was that the study required a lot of time to be dedicated to collecting substantial data from one respondent to another making observations, continuous review of literature, data analysis and report writing.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter presents the facts, which the researcher discovered. The findings were presented in line with the objectives of the study whereby the raw data in form of questionnaires was edited and interpreted which ensured uniformity, legibility and consistency. The data-filled questionnaires were copied and analyzed by tallying and tabling in frequency polygons while identifying how often certain responses occurred and later evaluation was done. The information was then recorded in terms of percentages. Also, interview results were coded on frequency tables which were calculated in terms of percentages and presented in this study as illustrated below.

4.2 The response rate

Response rate = $\underline{\text{total number of tools received}}$ x 100 $\quad = \underline{217\text{x }100}$ = 95%
                        Total number of tools given out $\quad\quad\quad$ 228

The study sampled228 respondents and all of them were able to be reached and they responded including the key informants who were Head teachers within Buikwe District, Officials from Buikwe District, Deputy Head teachers and Teachers plus other respondents who were the students.

Table 1

Respondents	Target Population	Sample size	Response	Response rate	Data collection method
Head teachers within Buikwe District	30	28	20	78%	Interview
Officials from Buikwe District	10	10	7	70%	Interviews
Deputy head teachers and Teachers	30	28	22	74%	Interviews
Students	280	162	155	95%	Structured questionnaires
Total	**350**	**228**		94%	

Source: primary data (2016)

Out of the total 350 targeted study respondents, 217were reached and positively responded by participating in the study, giving a 94% response rate. Non-achievement of 100% was due to respondents being busy and out of the school during the period of the study despite several attempts to make appointments.

4.3 Background Characteristics of the respondents

The Background information of the respondents was important because they comprised of both sexes but of different marital statuses and age groups from various settings. This was intended in order to get a variety of views and unbiased responses which made the study a reality. The respondents were divided into the Head teachers within Buikwe District, Officials from Buikwe District, Deputy Head teachers and Teachers Students. The findings are shown in the figures below;

Figure 4.1.1 Age of respondents
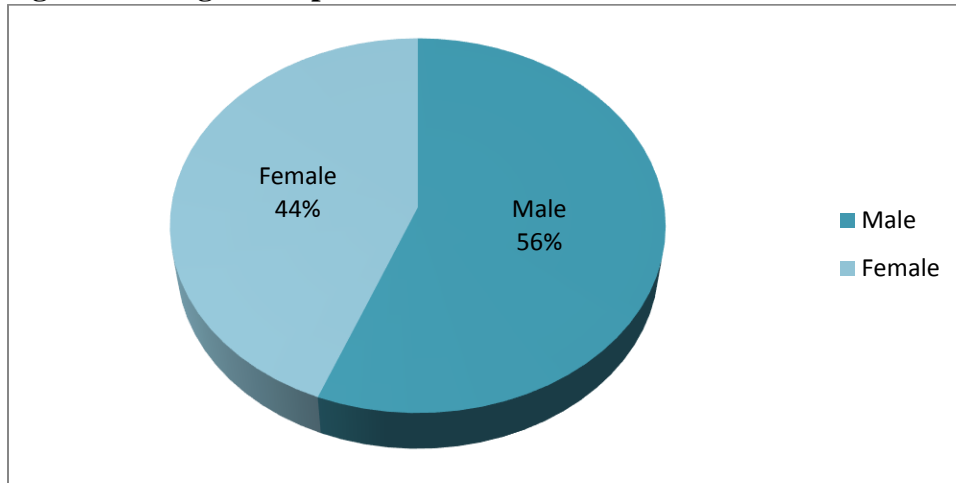
Source: primary source (2016)

From figure 4.1.1,it was found out that; males greatly participated in the study as represented by 56% whereas 44% of the respondents were females; implying that the male respondents actively participated in the study and it was realized that secondary schools in Buikwe district mostly had the biggest number of boys students and teachers for that matter compared to girls students and women teachers.

Figure 4.1.2 Gender of respondents
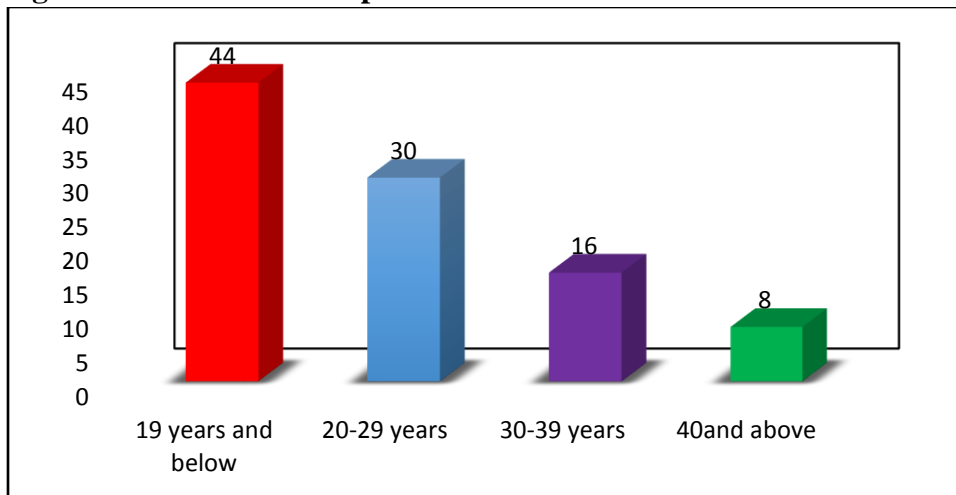
Source: primary source (2016)

Figure 4.1.2 above shows that; the biggest percentage of the respondents represented by 44% were found to be 19 years or less, followed by 30% of the respondents who were in the age bracket of 20-29 years, then 16% of the respondents were between 30-39 years and lastly but not the least

were 2% of respondents who were 50 and above years and lastly were 8% of respondents who were 40-49 years and above, implying that majority of the respondents being students their age was clearly justified to be in the range of 19 years and below.

Figure 4.1.3 Marital status of respondents
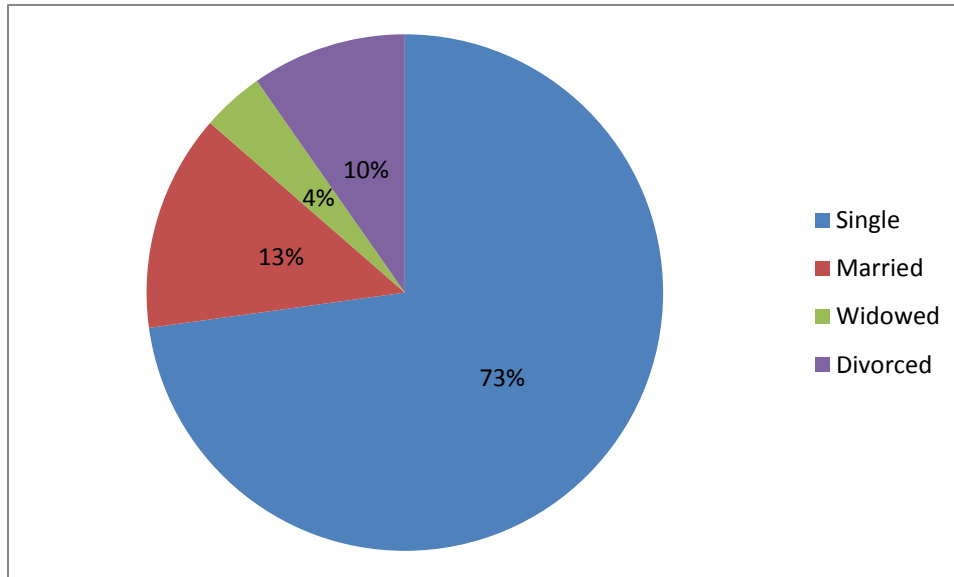
Source: primary source (2016)

An assessment of the respondents' marital status was as follows; the biggest percentage of the respondents were found to be single as shown by 74.5% where as 13.2% of the interviewees were found to be married, 9.6% of them were separated lastly 3.5% of the respondents were widowed implying that majority being single, and definitely most of them were students who used ICT at schools in Buikwe district during education programs as illustrated in figure 4.1.3 above.

Figure 4.1.4Education level of respondents
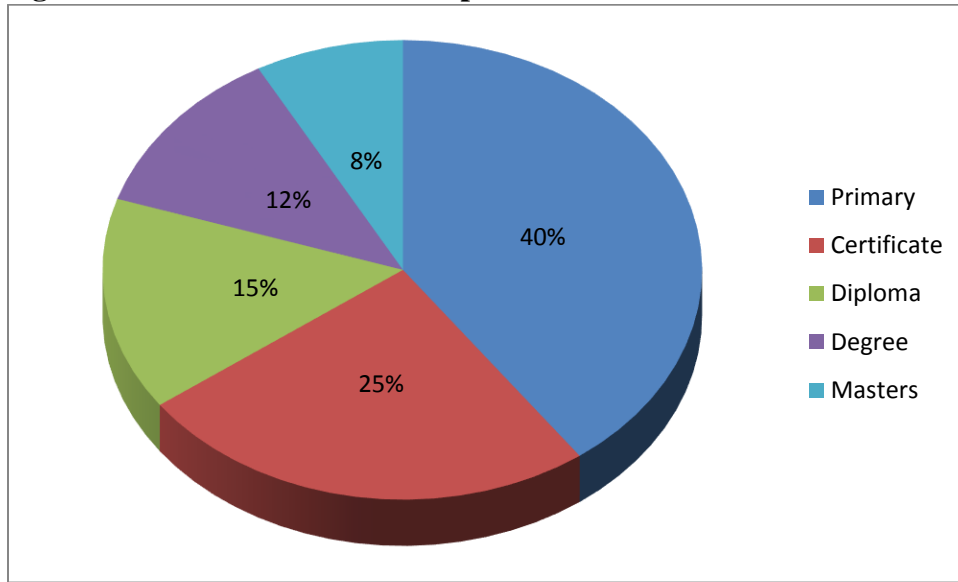
Source: primary source (2016)

The biggest percentage of respondents were in secondary levels as it was revealed by 40% of the respondents, then 25% of the respondents had certificate holders whereas 15% of the interviewees had attained their diplomas, 12% of the respondents were degree holders and lastly 8% of respondents had their master degrees implying that majority beings in secondary schools represented students from Buikwe district and formed a percentage of students doing information communication technology and education programmes as stipulated in table3 above.

Figure 4.1.5: Location of my school/institution

In the figure below, respondents were asked where their schools were located and their responses were illustrated in the figure as follows;
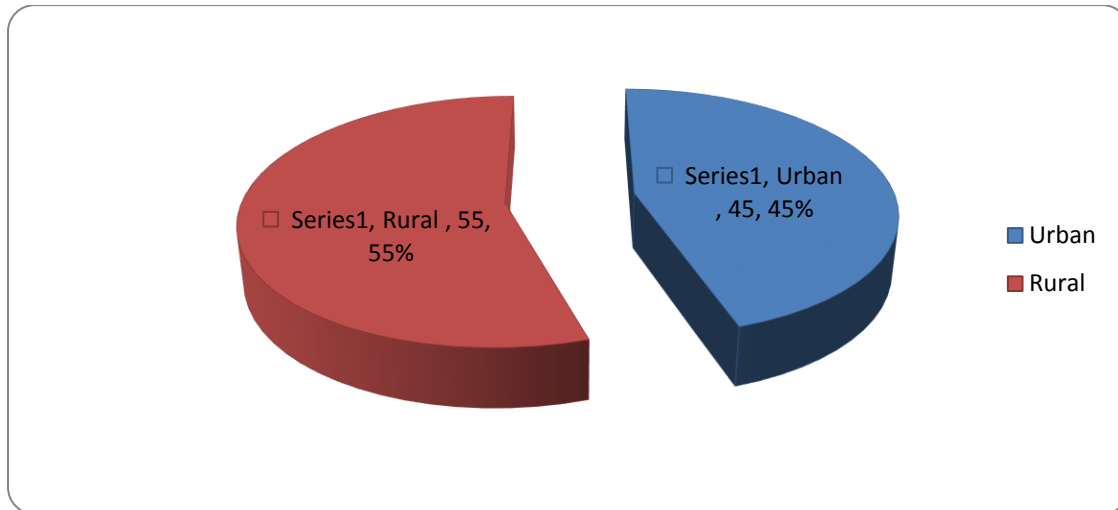
Source; Primary data (2016)

According to figure 4.1.5 majority of the respondents represented by 55% said in rural areas whereas 45% of the respondents revealed that they were from urban schools implying that most of the schools were using information communication technology in their education programmes because rural schools did not have electricity to power ICT machines and even schools could not even afford buying the ICT equipments as showed in figure 4.1.5 above.

Table 4.3: Respondent's period spent accessing ICT facilitates in this school

In the table below, respondents were asked of the period they spent accessing ICT facilitates in this school and their responses were as follows;

Occupation	Frequency	Percentage (%)
Less than 1 year	80	35
2-3years	120	52.6
4-6years	22	9.6
More than 6 years	8	3.5
Total	**228**	**100**

Source; Primary data (2016)
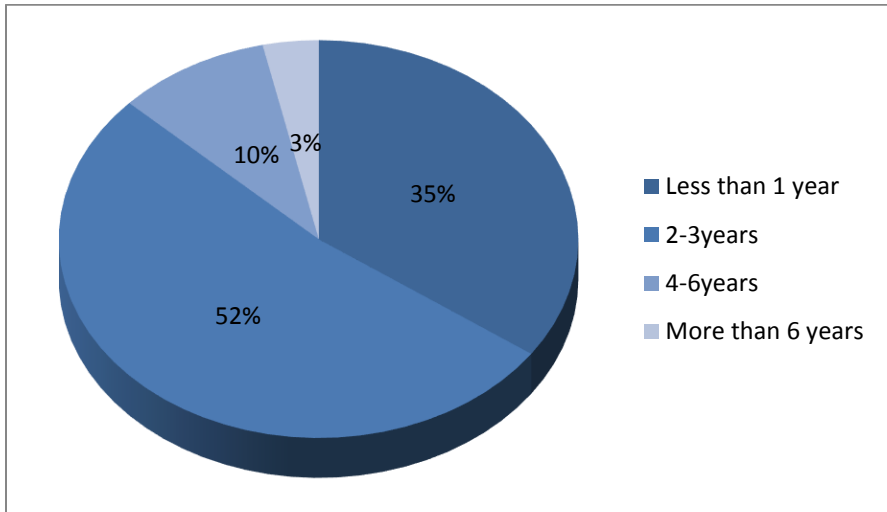
Source; Primary data (2016)

According to figure 4.2 above, majority of the respondents which involved both teachers, students and head teachers represented by 52.6% revealed that they spent accessing ICT facilitates in this school for 2-3 years these were followed by 35% of the respondents who said they spent accessing ICT facilitates in this school, less than a year 9.6% of the respondents of respondents said they spent accessing ICT facilitates in this school,3.5% of the respondents revealed that they spent accessing ICT facilitates in this school for more than 6 years. Implying that majority of the respondents was in school between 2-3 years when education programmes were introduced in the schools and got a chance of accessing ICT.

Figure 4.1.5: Areas in the school/ institution where computers were used

Responses on areas in the school/ institution where computers were used included office, staffroom, computer lab, classroom, library and other places as illustrated in the figure below;
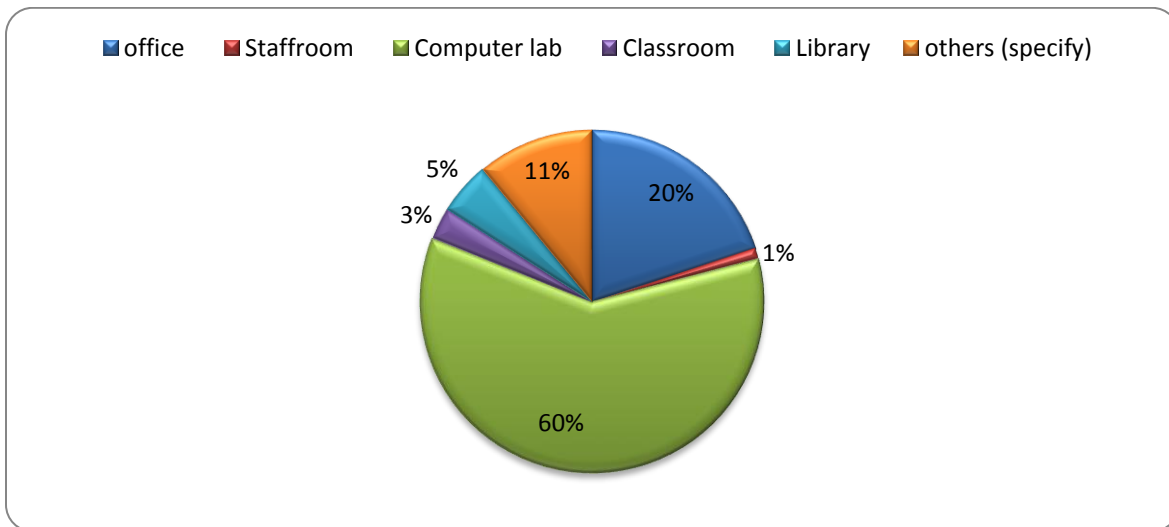
Source; Primary data (2016)

Numerous responses were put forward when respondents were asked of the areas in the school/ institution where computers were used and their responses were as follows; the biggest percentage of the respondents represented by 60% said computers were used in labs whereas 20% of the respondent said computers were used in offices also 11% of the respondents said computers were used in other areas like the bursars offices, accounts office, and the Directors of studies office, 5% of the respondents also said computers were used in the library to store books records. Last but not the least 3% of the respondents said computers were used in classrooms, lastly to note respondents revealed that computers were used in staffrooms.

4.2 OBJECTIVE ONE: THE LEVEL OF ICT USAGE IN THE TEACHING/LEARNING PROGRAMS IN SELECTED SECONDARY SCHOOLS

Table 4.2.1 Purposes teachers /students used ICT
The study was looking at the purposes teachers /students used ICT in their responses were illustrated in the table below

	Frequency	**Percent**
Strongly agree	70	30.7
Agree	60	26.3
Not sure	20	8.7
Disagree	50	21.9
Strongly disagree	28	12.2
Total	**228**	**100.0**
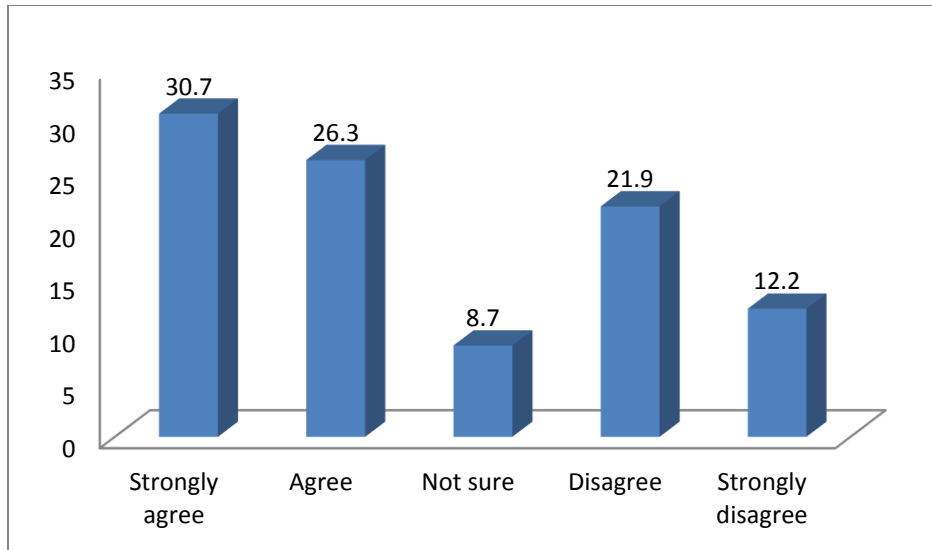
Source: Primary Data

Source; Primary data (2016)

The research findings indicate that the (30.7%) of the respondents strongly agreed that there are purposes they uses ICT and these included computers in the laboratory where they do research from, printers used to print the research work and also sharing of information like different departments sharing with other (accounts department sharing information with the director of studies on student who have paid school fees and those who haven't(26.3%) of the respondents agreed, (8.7%) of the respondents were not sure while (21.9%) of the respondents disagreed finally the (12.2%) of the respondents strongly disagreed that there are purposes they use ICT with teachers /students.

Table 4.2.2: Teachers/students use computers in various activities

The study was looking at whether teachers/students use computers in various activities and their responses were well illustrated in the table below;

	Frequency	**Percent**
Strongly agree	120	52.6
Agree	80	35.0
Not sure	5	2.1
Disagree	13	5.7
Strongly disagree	10	4.3
Total	**228**	**100.0**

Source; Primary data (2016)
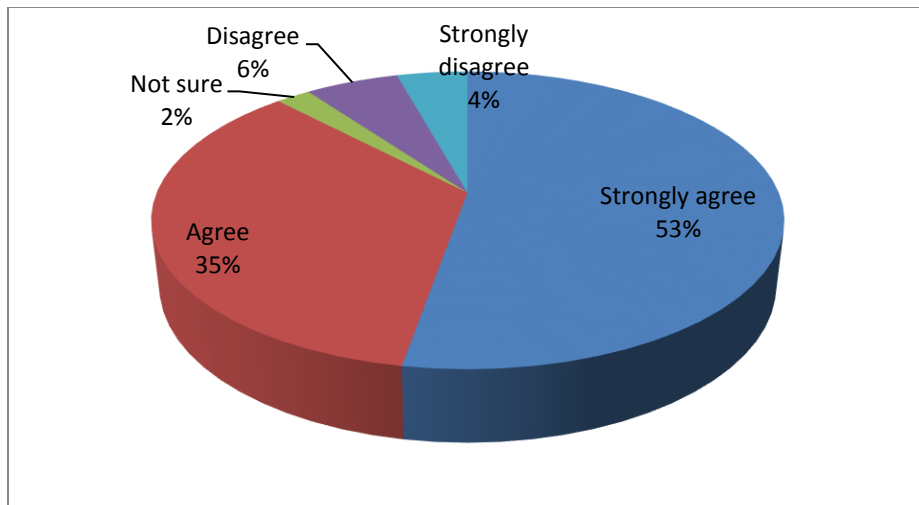
Source; Primary data (2016)

The research findings shows that the (52.6%) of the respondents strongly agreed that Teachers/students use computers in various activities and they include research, knowledge of operating them, printing documents inform of notes and they revealed that out of the above activities the level of ICT usage in the teaching/learning programs was recorded to be high (35.0%) of the respondents agreed, (5.7%) of the respondents disagreed while (4.3%) of the respondents strongly disagreed that Teachers/students use computers in various activities finally the (2.1%) of the respondents were not sure.

Table 4.2.3 Computers are potential in ICT and support in teaching and learning processes with your class

The study's intention was looking at role of computers in ICT and support in teaching and learning processes in secondary school and in the table below the responses were illustrated inform of Strongly agree, Agree, Not sure, Disagree and Strongly disagree

	Frequency	**Percent**
Strongly agree	110	48.2
Agree	80	35.0
Not sure	10	3.4
Disagree	20	8.7
Strongly disagree	8	3.5
Total	**228**	**100.0**

Source; Primary data (2016)
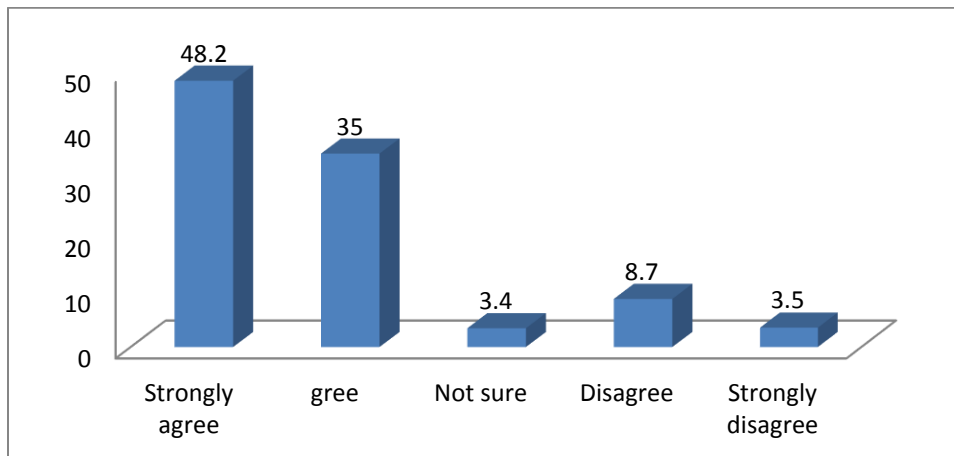
Source; Primary data (2016)

The research findings express that the (8.7%) of the respondents disagreed that computers are potential in ICT and support in teaching and learning processes with your class(35.0%) of the respondents agreed, (48.2%) of the respondents strongly agreed that computers are potential in ICT and support in teaching and learning processes whereby for any information that you need from the internet it can be acquired through ICT and also in the same way it is through the use of computers that you can acquire more information by carrying out research using google.com as the browser while (3.5%) of the respondents strongly disagreed that computers are potential in ICT and support in teaching and learning processes with your class finally (3.4%) of the respondents were not sure.

Table 4.10: There are main roles when using ICT in class
The study was looking at main roles of ICT in class where majority which were clearly illustrated in the table below with option of strongly agree, Agree, Not sure, Disagree and strongly disagree

	Frequency	Percent
Strongly agree	80	30
Agree	70	30.7
Not sure	30	13.1
Disagree	28	12.2
Strongly disagree	20	8.7
Total	**228**	**100.0**

Source; Primary data (2016)
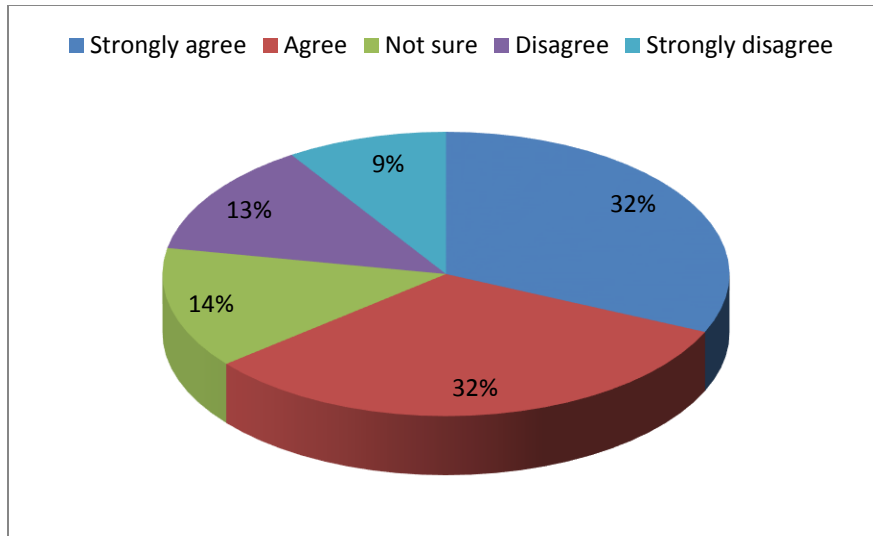
Source; Primary data (2016)

The research shows that the 48 (46.6%) of the respondents strongly agreed main roles of ICT in class included using projectors and laptops instead of chalks and blackboards and also using computers or laptops in class it becomes easier for student and teacher to access materials, illustration and various examples from internet 44 (42.7%) of the respondents agreed, 8 (7.8%) of the respondents disagreed while 2 (1.9%) of the respondents strongly disagreed finally the 1 (1%) of the respondents were not sure.

Table 4.11: I have the skills in using ICT

Under this the study was interested in finding out whether students/teacher have the skills in using ICT and the results were determined using strongly agree, agree, not sure, disagree and strongly disagree in the table below

	Frequency	Percent
Strongly agree	10	4.3
Agree	13	5.7
Not sure	5	2.1
Disagree	50	21.9
Strongly disagree	150	65.7
Total	**228**	**100.0**

Source; Primary data (2016)
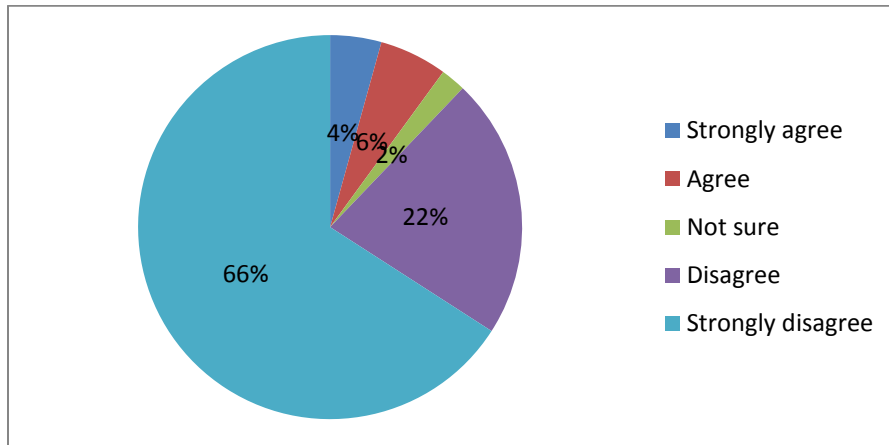
Source; Primary data (2016)

The research findings exhibit that the (21.9%) of the respondents disagreed that they have skills in using ICT(65.7%) of the respondents strongly disagreed that they have skills in using ICT this was not argued against since majority of the respondents revealed that the biggest number of the schools were situated in rural areas where you rarely expected students/teacher to use ICT services because of power problems and the limited funds to acquire the ICT equipment, (4.3%) of the respondents strongly agreed while (5.7%) of the respondents agreed finally the (2.1%) of the respondents were not sure.

Table 4.12: I can develop the skills I need

	Frequency	Percent
Strongly agree	10	4.3
Agree	15	6.5
Not sure	3	1.3
Disagree	70	30.7
Strongly disagree	130	57.0
Total	**228**	**100.0**

Source; Primary data (2016)
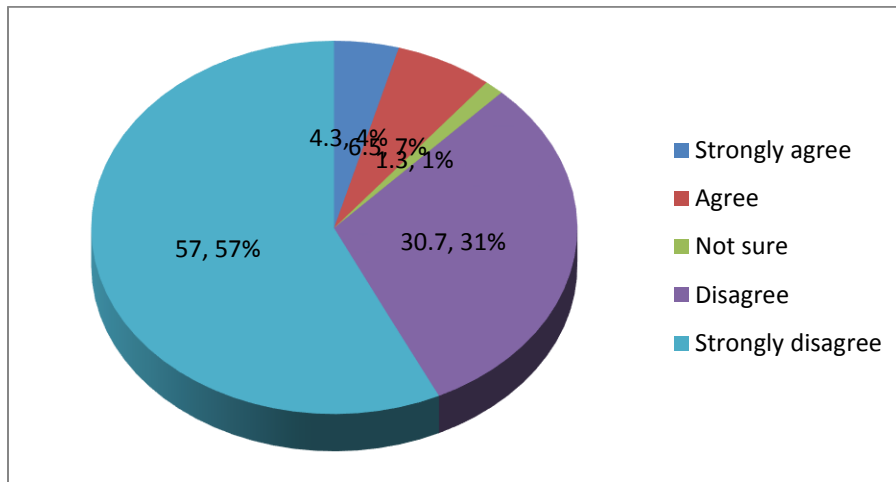
Source; Primary data (2016)

The research findings indicate that the (30.7%) of the respondents disagreed that they can develop the skills I need (57.0%) of the respondents strongly disagreed that they can develop the skills I need, (4.3%) of the respondents strongly agreed while (6.5%) of the respondents agreed finally the (1.3%) of the respondents were not sure about whether they can develop the skills I need.

4.3 OBJECTIVE TWO: FACTORS HINDERING THE EFFECTIVE UTILIZATION OF ICTS IN EDUCATION PROGRAMMES IN SELECTED SECONDARY SCHOOLS

Table 4.13: Most teachers are not infamous of use of ICT at school

This study was looking at the past records teachers were having in as far as using ICT was

concerned where this was got using the following views strongly agree, agree, not sure, disagree

and strongly disagree

	Frequency	Percent
Strongly agree	110	48.2
Agree	90	39.4
Not sure	2	0.8
Disagree	13	5.7
Strongly disagree	8	3.5
Total	**228**	**100.0**

Source; Primary data (2016)
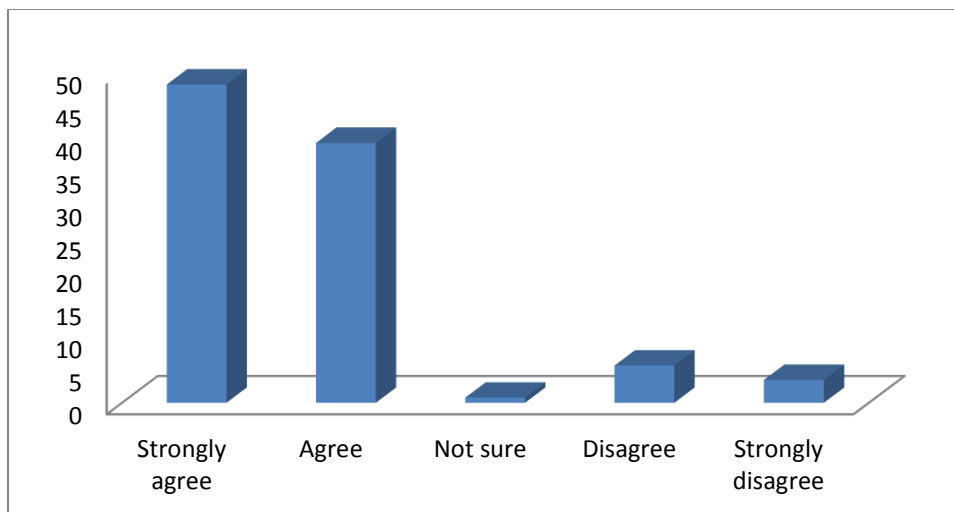
Source; Primary data (2016)

The findings show that the (48.2%) of the respondents strongly agreed (39.4%) of the respondents

agreed that most teachers are not famous of using of ICT at school, this implies that effective

utilization of ICTS in education programmes in selected secondary schools was a hard issue to be

achieved because it's the teacher that are supposed to use ICT in education programs but because

they were not famous the effective utilization was far from being achieved(5.7%) of the

respondents disagreed while (3.5%) of the respondents strongly disagreed finally the (0.8%) of the respondents not sure.

Table 4.14: there is lack of tutorial frameworks on how to use ICT
The study was establishing whether there are tutorial frameworks on how to use ICT using strongly agree, agree, not sure, disagree and strongly disagree

	Frequency	Percent
Strongly agree	160	70.1
Agree	50	21.9
Not sure	10	3.4
Disagree	3	1.3
Strongly disagree	8	3.5
Total	**228**	**100.0**

Source; Primary data (2016)
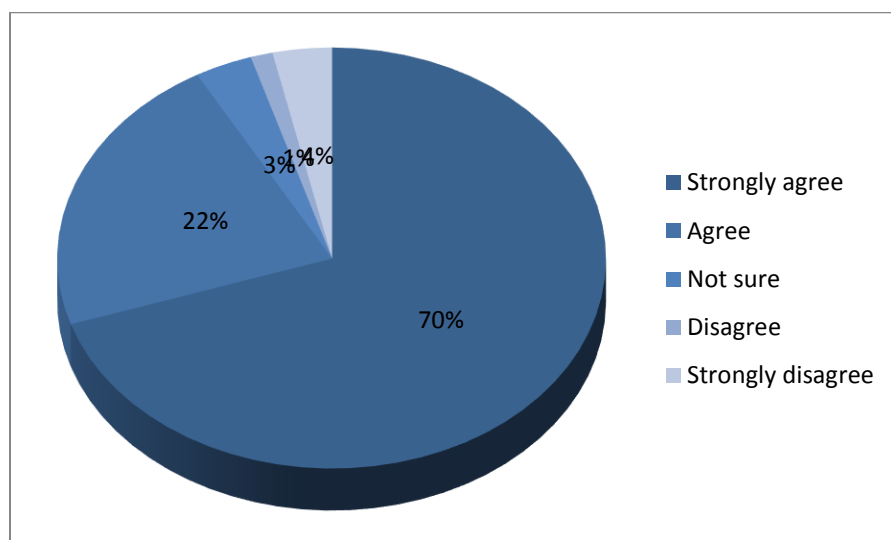
Source; Primary data (2016)

The research findings also indicate that the (1.3%) of the respondents disagreed that there was tutorial frameworks on how to use ICT (21.9%) of the respondents agreed that there was lack of tutorial frameworks on how to use ICT, (3.5%) of the respondents strongly disagreed that there were tutorial frameworks on how to use ICT which implied that effective utilization of ICT in

education programs far from being achieved because of the absence of the tutorial frameworks at school while (70.1%) of the respondents strongly agreed (3.4%) of the respondents not sure.

Table 4.15: it's difficult to integrate ICT use into the curriculum
The table below replies on whether it was difficult to integrate ICT use into the curriculum and this was achieved using the disagree, strongly agree, agree and strongly disagree

	Frequency	Percent
Disagree	20	8.7
Strongly agree	8	3.5
Agree	120	52.6
Strongly disagree	80	35.0
Total	**228**	**100.0**
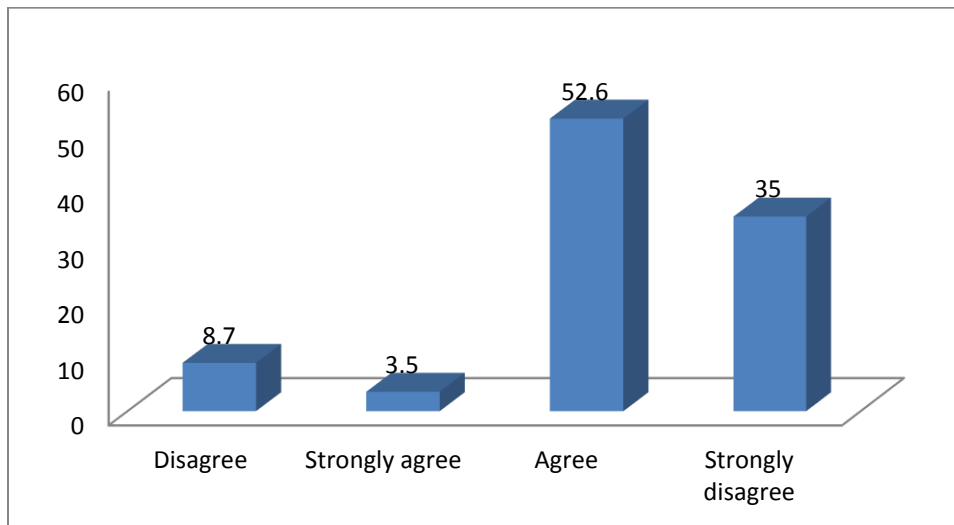
Source; Primary data (2016)

Source; Primary data (2016)

The research findings show that the (3.5%) of the respondents strongly agreed that it's difficult to integrate ICT use into the curriculum (52.6%) of the respondents agreed that it was difficult to integrate ICT use into the curriculum. This was judged from the respondents views that the ministry of education uses the old curriculum where by the time it was designed the level of ICT

use was still low.(35.0%) of the respondents strongly disagreed that it's difficult to integrate ICT use into the curriculum while (8.7%) of the respondents disagreed.

Table 4.16: There is insufficient technical support for teachers
The study was interested in finding out whether technical support for teachers was available in secondary schools in Buikwe district where the responses were determined using strongly agree, agree, not sure, disagree, strongly disagree

	Frequency	Percent
Strongly agree	155	67.9
Agree	45	19.7
Not sure	7	3.0
Disagree	10	4.3
Strongly disagree	11	4.8
Total	**228**	**100.0**

Source; Primary data (2016)
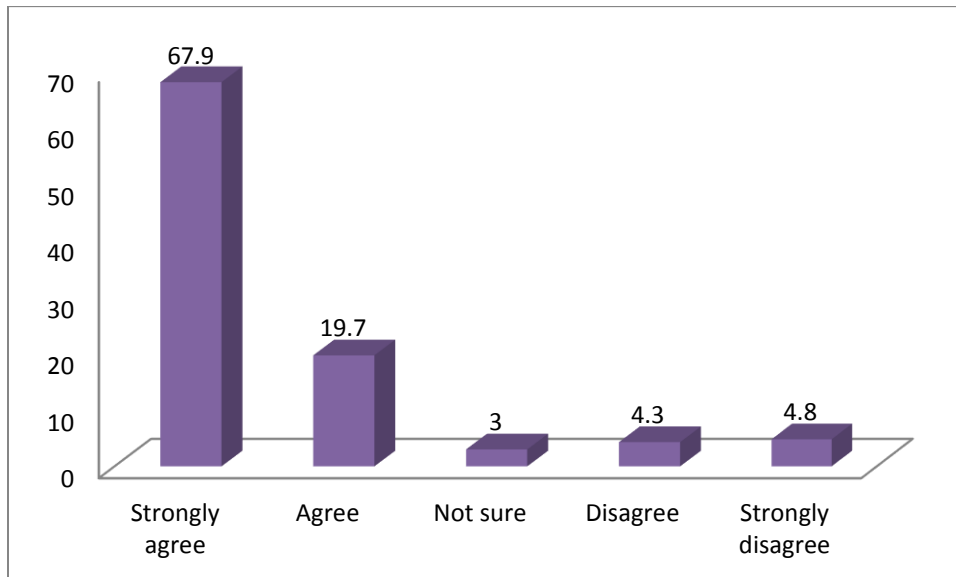
Source; Primary data (2016)

The research findings indicate that the 33 (32%) of the respondents strongly agreed 36 (35%) of the respondents agreed with the statement implying that the schools could not afford providing the support others it was not with their budget, 27 (26.2%) of the respondents disagreed while 5 (4.9%) of the respondents strongly agreed finally the 2 (1.9%) of the respondents were not sure.

Table 4.17: There are insufficient numbers of computers
The study wanted to find out the availability of computer in secondary schools in Buikwe district and was achieved using the following nature of responses as illustrated in the table below;

	Frequency	Percent
Strongly agree	170	75.5
Agree	40	17.5
Not sure	8	3.5
Disagree	20	8.7
Total	**228**	**100.0**
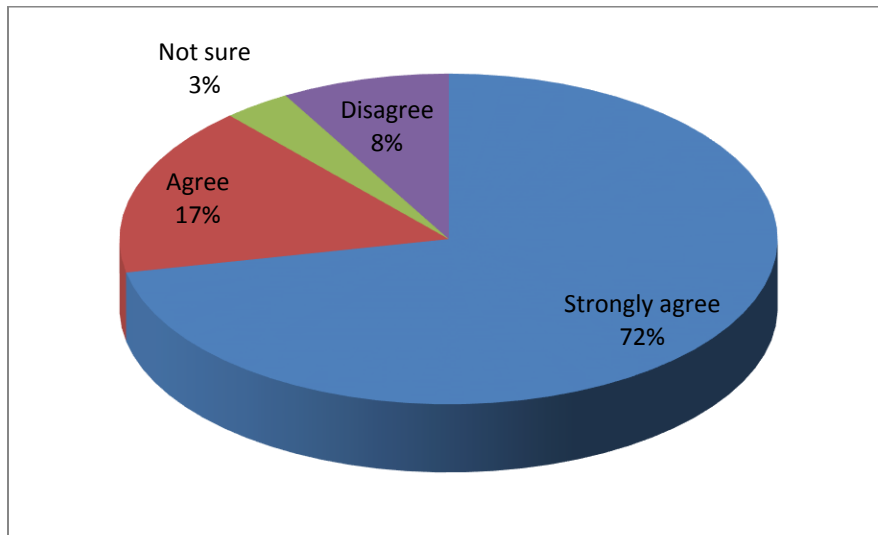
Source; Primary data (2016)

Source; Primary data (2016)

The research findings show that the (75.5%) of the respondents strongly agreed that there were insufficient number of computers (17.5%) of the respondents agreed that insufficient number of computers, this implies that since majority of the secondary schools in Buikwe district were said be found in rural areas justifies a lot where factors like electricity, limited funds to computer, poor infrastructure (8.7%) of the respondents disagreed that insufficient number of computers while (3.5%) of the respondents were not sure that there insufficient number of computers.

4.4 OBJECTIVE THREE: POSSIBLE REMEDIES TO THE CHALLENGES WHICH HINDER ICT UTILIZATION IN THE SELECTED SECONDARY SCHOOLS

Table 4.18 schools should encourage and reward the technology application, design and usage in curricular activities

The study's intentions were to find out whether encouraging and rewarding the technology application, design and usage in curricular activities could reduce the challenges which hinder ICT utilization in the selected secondary schools

	Frequency	Percent
Strongly agree	20	8.7
Agree	8	3.5
Not sure	40	17.7
Disagree	170	74.5
Total	**228**	**100.0**

Source; Primary data (2016)
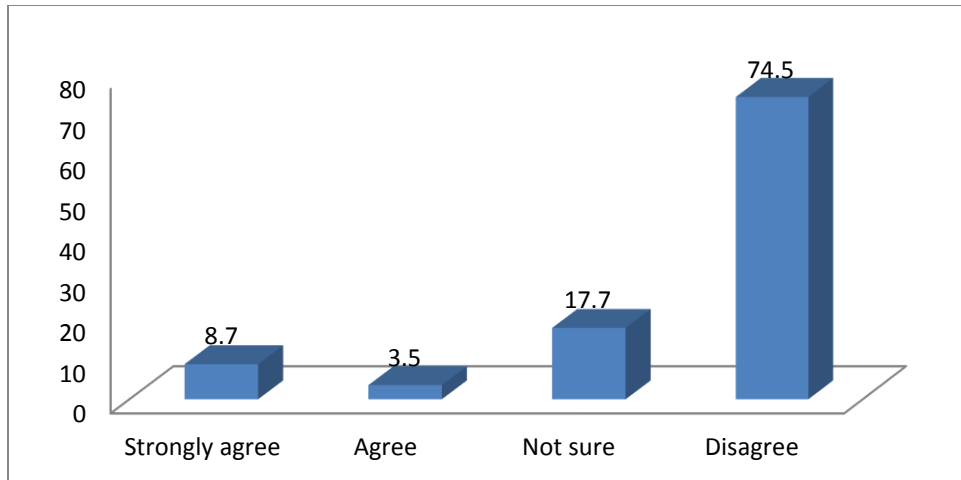
Source; Primary data (2016)

According to table 4.18 previously above, the biggest percentage of the respondents represented by 74.5% disagreed that schools encourage and rewarding the technology application, design and usage in curricular activities whereas 17.7% were found not sure whether that schools encourage and rewarding the technology application, design and usage in curricular activities and 3.5% of the respondents agreed that that schools encourage and rewarding the technology application, design and usage in curricular activities and lastly 8.7% of the respondents also strongly agreed that that schools encourage and rewarding the technology application, design and usage in curricular activities

Table 4.19; there should be investments by schools on ICTs infrastructure
The study's intentions were to find out whether be investments by schools on ICTs infrastructure could solve the challenges which hinder ICT utilization in the selected secondary schools

		Frequency	Percent
	Strongly agree	8	3.5
	Agree	20	8.7
	Strongly disagree	120	52.6
	Disagree	80	35.0
	Total	**228**	**100.0**

Source; Primary data (2016)
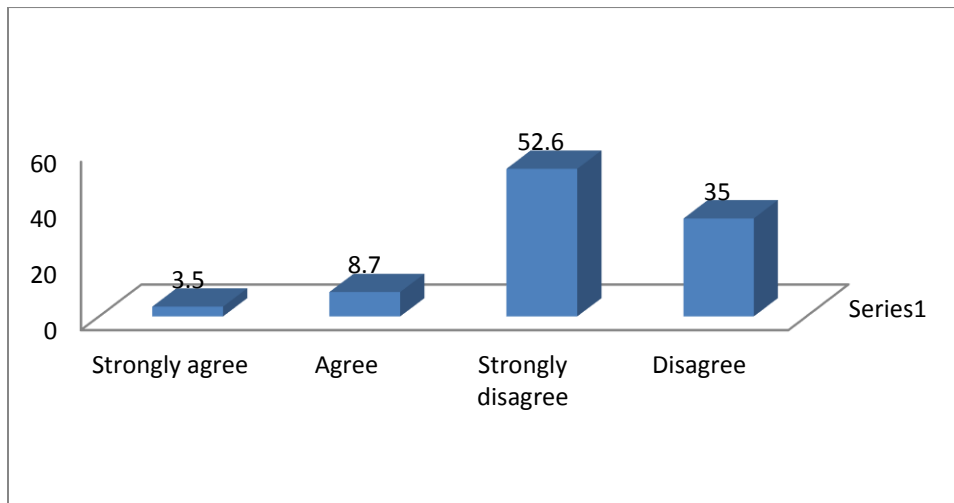
Source; Primary data (2016)

An assessment of the respondent's investments by school on ICTs infrastructure was as follows; the biggest percentages of the respondents represented by 52.6% strongly agreed whereas 35.0% of the respondents also agreed implying that if the ICTs infrastructure was to be in place then there would be no challenges which hinder ICT utilization in the selected secondary schools and 8.7% of the respondents agreed and lastly 3.5% of the respondents strongly agreed there are investments by school on ICTs infrastructure

Table 4.19; there should be developing the policies and plans for diffusion of ICTs in learning and teaching

The study was looking at whether developing the policies and plans for diffusion of ICTs in learning and teaching would reduce the challenges which hinder ICT utilization in the selected secondary schools

	Frequency	Percent
Strongly agreed	80	35.5
Agree	60	26.3
Strongly disagree	70	30.7
Disagree	18	7.8
Total	**228**	**100.0**
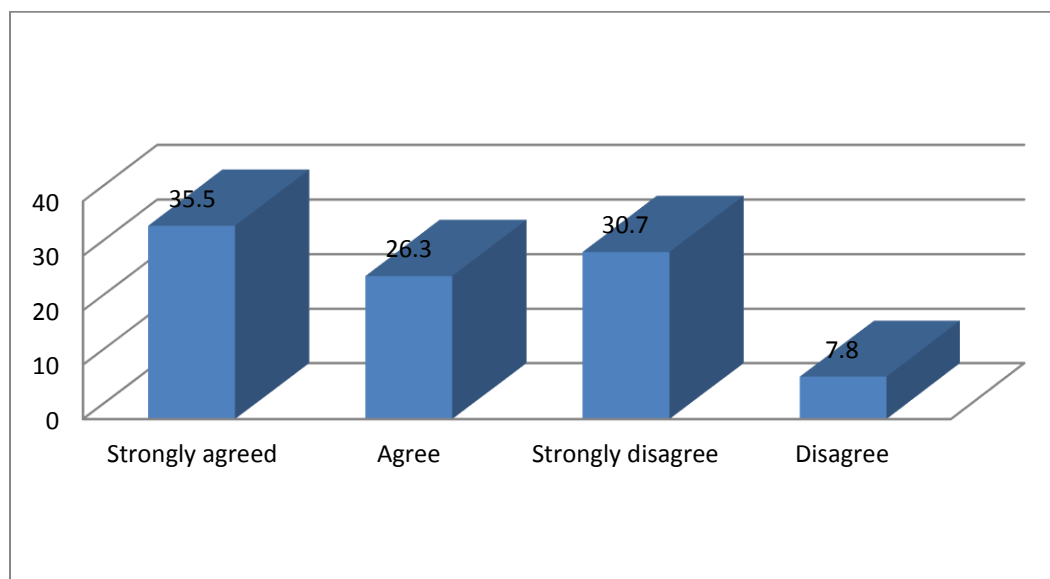
Source; Primary data (2016)

Source; Primary data (2016)

Numerous responses were put forward when respondents were asked about the developing the policies and plans for diffusion of ICTs in learning and teaching and their responses were as follows; majority of the respondents represented by 35.5% strongly agreed and 26.3% also agreed implying that if policies and plans for diffusion of ICTs in learning and teaching then the challenges which hinder ICT utilization in the selected secondary schools would be very few whereas 30.7% of the respondents strongly disagreed and 7.8% of the respondents also disagreed that there were developing the policies and plans for diffusion of ICTs in learning and teaching

Table 4.20; Students should be encouraged to participate in ICT practical's
The study was looking at whether students should be encouraged to participate in ICT practical's using the following responses strongly agree, agree, strongly disagree and disagree

	Frequency	**Percent**
Strongly agree	60	26.3
Agree	90	39.4
Strongly disagree	50	21.9
Disagree	28	12.2
Total	**228**	**100.0**

Source; Primary data (2016)
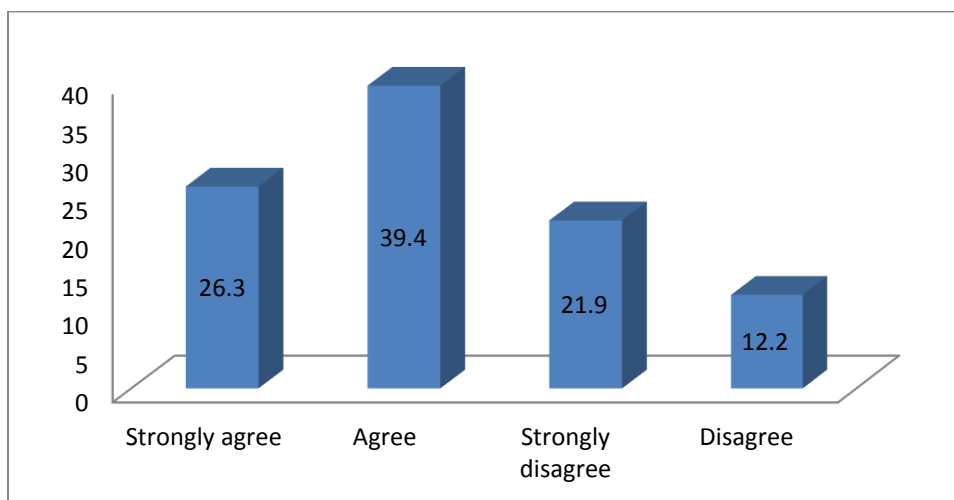
Source; Primary data (2016)

According to figure 4.20, 39.4% of the respondents agreed that students should been couraged to participate in ICT practical in the same way respondents also strongly agreed that students should be encouraged to participate in ICT practical implying that in the students were lowed or taken through practical's then challenges which hinder ICT utilization in the selected secondary schools would have been few whereas 21.9% of the respondents strongly disagreed that students should not been courage and 12.2% of the respondents disagreed that students are not encouraged to participate in ICT practical.

Table 4.21; Students should be encouraged to attend ICT seminars both within the school and outside

The study was looking at whether students should be encouraged to attend ICT seminars both within the school and outside using strongly agree, agree, strongly disagree, and disagree

	Frequency	Percent
Strongly agree	70	30.7
Agree	60	26.3
Strongly disagree	80	35.0
Disagree	18	7.8
Total	**228**	**100.0**

Source; Primary data (2016)
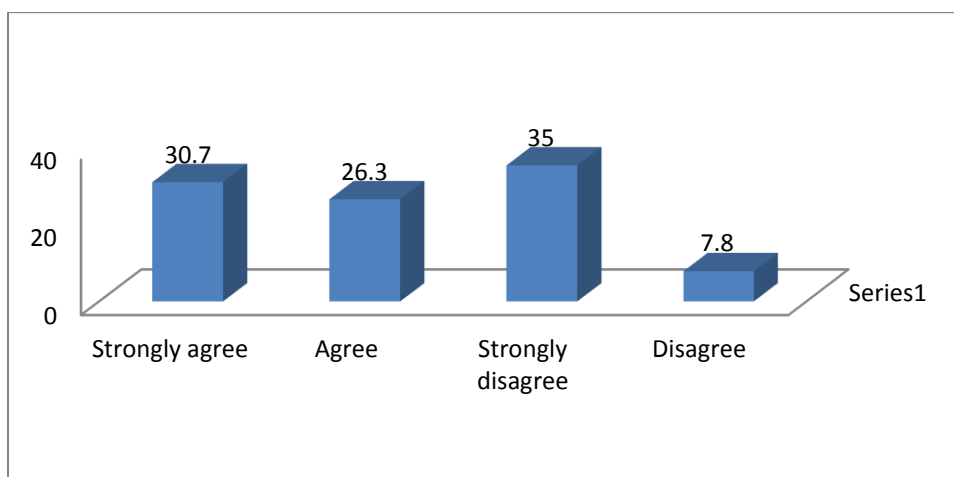
Source; Primary data (2016)

An assessment of the students attending ICT seminars both within the school and outside was as follows; 30.7% of the respondents strongly agreed that they should be encouraged in the same way 26.3% of the respondent also agreed that students should be encouraged to attend ICT seminars implying that if students were encouraged to attend ICT seminars both within the school and outside them challenges would be very few however surprisingly, 35.0% of the respondents strongly disagreed and 7.8% of the respondents also disagreed that students should not encouraged to attend ICT seminars both within the school and outside.

4.5 Summary and Discussion of the Findings

Findings indicated that, students and the teachers had some skills and competence in using computers in learning or instructional environments. Most of the respondents also perceived that their mastery of the different technology tools was increasing as they increased the usage of such tools in education or other social activities. The belief in their ability to effectively use ICTs tools and their belief that their mastery improved with use indicated a high degree of self-efficacy.

The findings on self-efficacy also indicated that both students and the teachers of the surveyed in Buikwe district had accepted the important role that ICTs play education programms. These results indicate that technology in its different from had been accepted by both the teachers, administrators and students in these secondary schools. The respondents are seen to take technology as an enabling tool for instruction, as a communication tool between administrators and students and also as an enabler to make learning and instruction more flexible. Teachers and administrators in some secondary schools were however poor in mastery of usage of ICTs and were deficient in its use but this was the exception rather than the rule.

Lack of confidence or know-how on how to handle the different ICTs equipments would make both students and teachers shun ICTs in training or learning.

Further, I observed that adoption of technology for teaching and learning in the secondary schools in Buikwe district surveyed depended very much on the willingness, acceptance, agreement and the continuous use of the different ICTs by the teachers, administrators and students. Those secondary schools whose students viewed ICTs as a necessary enabler in education programs had

good facilities, self-efficacy in their students and also high levels of adoption. The culture at the secondary schools was seen as having wholly accepted ICTs as a necessary advancement. Not only the secondary schools have accepted ICTs but the community and the corporate sector have indicated the need to have use and mastery of ICTs both at work and for other education purposes.

4.5.1 The level of ICT usage in the teaching/learning programs in selected secondary schools

The research findings indicate that the (30.7%) of the respondents strongly agreed that there are there are purposes I use ICT with teachers /students. The research findings show that the (52.6%) of the respondents strongly agreed that Teachers/students use computers in various activitie**s** (35.0%) of the respondents agreed, (5.7%) of the respondents disagreed while (4.3%) of the respondents strongly disagreed that Teachers/students use computers in various activitie**s** finally the (2.1%) of the respondents were not sure. The research shows that the 48 (46.6%) of the respondents strongly agreed 44 (42.7%). In the same way Anguyo, (2013) urged that ICT enhances the quality and accessibility of education in a way that ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere through use of computers and internet; (iii) ICT enhances learning environment in a way that ICT presences in schools creates an entirely new learning environment that challenges students to adopt different skill so that to be successful. Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through; (iv) ICT enhances learning motivation in such a way that with a shift of curricula from "content-centered" to "competence-based", the mode of curricula delivery has now shifted from "teacher centered" forms of delivery to "student-centered" forms of delivery. ICT in education motivates learning through provisions of devises such as videos, television and multimedia computer software.

4.5.2 The various factors hindering the effective utilization of ICTs in education programmes in selected secondary schools

There was lack of tutorial frameworks on how to use ICT (70.1%), the findings show that the (48.2%) of the respondents strongly agreed (39.4%) of the respondents agreed that most teachers are not infamous of use of ICT at school. The research findings show that the (3.5%) of the respondents strongly agreed that it's difficult to integrate ICT use into the curriculum (52.6%) of the respondents agreed that it's difficult to integrate ICT use into the curriculum. The research

findings indicate that the 33 (32%) of the respondents strongly agreed 36 (35%) of the respondents were agreed. The research findings show that the (75.5%) of the respondents strongly agreed that insufficient number of computers (17.5%) of the respondents agreed that insufficient number of computers. These findings were in agreement with Janassen, (2011) who emphasized that ICT integration in education should parallel with teachers professional development. The school leadership also plays a key role in the integration of ICT in education through organizing refresher courses and training of staff in ICT related courses to ensure that teachers are acquainted with the current and relevant technology. Thus, for the effectiveness of ICT integration in education, administrators must be competent and have broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education.

4.5.3 Possible remedies to the challenges which hinder ICT utilization in the selected secondary schools

Majority of the respondents represented by 35.5% strongly agreed and 26.3% also agreed that there should be developing the policies and plans for diffusion of ICTs in learning and teaching also to note 39.4% of the respondent agreed that students should be encouraged to participate in ICT practical's in the same way respondents also strongly agreed that students should be encouraged to participate in ICT practical. In addition, the students attending ICT seminars both within the school and outside was as follows; 30.7% of the respondents strongly agreed that they should be encouraged in the same way 26.3% of the respondent also agreed that students should be encouraged to attend ICT seminars. In the same way, the Edinburgh ICT Self Evaluation Framework (2012), the effective and appropriate use of ICT, both in the classroom and beyond, can enhance the learning experience. By including ICT in all curricular areas, learners will benefit from greater personalization and choice, resulting in improved learner engagement and outcomes. The Edinburgh ICT Self- Evaluation Framework was thus created to provide a structure for reviewing establishment's on use of ICT and its impact on school improvement. By using this framework schools are able to engage in a reflective professional process that helps identify the way forward in embedding ICT throughout the curriculum, informing overall strategy and improving their plans.

4.6 Levels of Usage, Factors Hindering and Recommended Solutions

Level of Usage

-ICT enhances teaching and learning process

-ICT enhances the quality and accessibility of education

-ICT enhances learning environment

-ICT enhances learning motivation

→

Factors hindering

-Most teachers are not infamous of use of ICT

-Lack of tutorial frameworks

-Difficult to integrate ICT use into the curriculum

-Insufficient technical support for teachers

-Insufficient numbers of computers

→

Recommendations

-There should be investments by schools on ICTs infrastructure

-There should be developing the policies and plans for diffusion of ICTs

-Students should be encouraged to participate in ICT practicals

-Students should be encouraged to attend ICT seminars

4.7 Summary

The findings in this chapter were presented in line with the objectives of the study that was; the level of ICT usage in the teaching/learning programs in selected secondary schools, factors hindering the effective utilization of ICTS in education programmes in selected secondary schools and the possible remedies to the challenges which hinder ICT utilization in the selected secondary schools whereby the raw data in form of questionnaires was edited and interpreted which ensured uniformity, legibility and consistency. The data-filled questionnaires were copied and analyzed by tallying and tabling in frequency while identifying how often certain responses occurred and later evaluation was done. The information was then recorded in terms of percentages. Also, interview results were coded on frequency tables which were calculated in terms of percentages and presented.

CHAPTER FIVE

SUMMARY, DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter mainly deals with summary, of the chapters, limitations from the methodology, its strengths and weaknesses, conclusion and recommendations related to the utilization of information communication technology and education programmes in the selected secondary schools; a case of Buikwe district Uganda all was being drawn from the findings and analysis made after conducting the study. This was aimed at the extent to which seismic survey activities contribute to land conflicts, how exploratory well drilling activities contribute to land conflicts and how building of roads contribute to land conflicts.

5.2 Summary of the thesis

From chapter one, the background to the study, statement of the problem, purpose of the study, specific objectives, research questions, scope of the study, significance of the study and operational definition of the key variables and conceptual framework. Chapter two the related literature was reviewed that had been explored and studied both theoretically and empirically on the existing literature on the relationship between information communication technology and education programmes in institutions of learning in developing countries and elsewhere in the world and this was done in line with the specific objectives of the study in order to identify the knowledgeable gaps. Chapter which contained the methodology was used during the study. It involved the Research design, study population, sample size and selection, sampling techniques, data collection methods, Data collection instruments, procedure of data collection, Reliability and validity of instruments, Data analysis plus measurement of variables. In chapter four, the findings were presented in line with the objectives of the study whereby the raw data in form of questionnaires was edited and interpreted which ensured uniformity, legibility and consistency.

5.3 Answer to objectives

From objective one which was to identify the level of ICT usage in the teaching/learning programs in selected secondary schools it was discovered that students and the teachers had some skills and competence in using computers in learning or instructional environments. Most of the respondents

also perceived that their mastery of the different technology tools was increasing as they increased the usage of such tools in education or other social activities.

Then objective two which was to establish the various factors hindering the effective utilization of ICTs in education programmes in selected secondary schools was that Lack of confidence or know-how on how to handle the different ICTs equipments would make both students and teachers shun ICTs in training or learning. In addition, that adoption of technology for teaching and learning in the secondary schools in Buikwe district surveyed depended very much on the willingness, acceptance, agreement and the continuous use of the different ICTs by the teachers, administrators and students.

And objective three which was to suggest possible remedies to the challenges which hinder ICT utilization in the selected secondary schools were there should be developing the policies and plans for diffusion of ICTs in learning and teaching, students should be encouraged to participate in ICT practical's in the same way respondents also strongly agreed that students should be encouraged to participate in ICT practical. In addition, the students attending ICT seminars both within the school and outside

5.4 Limitations of the Methodology

The challenge of the used methodology was that there's no inherent flaw in case study design that precludes its broader application, it is preferable that researchers choose their case study sites carefully, while also basing their analysis within existing research findings that have been generated via other research designs. No design is infallible but so often has the claim against case studies been made, that some of the criticism (unwarranted and unfair in many cases) has stuck. In addition, suspicion of amateurism: Less partisan researchers might wonder whether the case study offers the time and finance-strapped researcher a convenient and pragmatic source of data, providing findings and recommendations that, given the nature of case studies, can neither be confirmed nor denied, in terms of utility or veracity.

For the population sampled, some respondents were not willing to set aside time to respond to the investigator's questions ended up frustrating the researcher's efforts to collect substantial data. The researcher also faced by a problem of some rude and hostile respondents. The researcher used

close ended questionnaire for all respondents. The use of questionnaire this did not enable the collection of detailed data from respondents this left out important information

However there were positives in the use of the methodology where the case study used were flexible case studies are popular for a number of reasons, one being that they can be conducted at various points in the research process. Researchers are known to favour them as a way to develop ideas for more extensive research in the future – pilot studies often take the form of case studies. They are also effective conduits for a broad range of research methods; in that sense they are non-prejudicial against any particular type of research – focus groups are just as welcome in case study research as are questionnaires or participant observation.

5.5 Conclusion
The demand for higher education in developing countries is surpassing the physical resources and time that are at the disposal of higher education schools that are in these developing countries. Given that there are limitations on physical resources and on academic time, the use of ICTs is essential to ensure that both quantity and quality of higher education is not compromised by the high demand experienced. Access to computers, Internet, laptops and tablets was perceived to be inadequate in most of the secondary schools in Buikwe district. Accessibility to technologically based education was also affected by availability of ICT resources in the homes or hostels of the students. Smartphone's were also reported to have revolutionized access to online learning materials. However, despite the revelation that ICTs are essential in making higher education accessible to the masses, some secondary schools in Buikwe district still lacked adequate resources to serve its students. This becomes a challenge when these secondary schools want to integrate ICTs in education as the students lack the requisite skills and competence to enable them apply technology in education.

There were various factors in the leading ICTs adopting in secondary schools which included top leadership support, strategy for use of ICTS and rewards for those students who excelled in use of ICTs in education programs and support services. Secondary schools that are lagging behind on the technology front should learn from the best technology adopters by ensuring that factors that motivate ICTs adoption as an education enabler are present. Most of the top leadership is however

perceived to acknowledge the fact that technology is important in basification of education and also enhancement of quality education. Most of the secondary schools are constantly engaged in efforts to ensure that they do not lag behind and be branded as technologically inept by the community and prospective students. However, in coming up with policy and facilities, the secondary schools consider the need and investments where financial capacity is usually a challenge.

5.6 Recommendations

Policy makers, providers of professional development programs for principals and for system level decision makers to support mechanism and strategies to assist Head teacher and secondary school owners to develop their knowledge, skills and their leadership style should understand the role that they play in facilitating the implementation of ICT in schools to improve teaching, learning and administrative processes.

It is also imperative that the Ministry of Education comes up with policies that will guide the use of ICT in schools. The government seems to be lagging behind because whereas computer studies has been introduced in secondary schools as part of the national curriculum, it has not kept up with the provision of the necessary infrastructure both physical and human resources. For example, there has been no teacher training course with computer studies as a teaching subject. ICT therefore seems to have been left to the ingenuity of the schools. This may explain the low levels of ICT integration among classroom teachers and the apparent advantage that schools with the owner who has ICT knowledge have.

There is need for the Ministry of Education to develop an ICT policy to streamline this important area of learning. The ministry needs to provide ICT teachers to schools and reward those who have the skills and are offering services so as to motivate them. It might also help to include integration of ICT in teaching as part of the school manager's annual performance appraisal to encourage them to adopt ICT integration in teaching and learning. The success or failure of integration of ICT in teaching and learning rests largely on institutional managers.

The secondary school owners, head teachers in Buikwe district and the whole country at large have therefore a professional responsibility and accountability to ensure that they are well trained in ICT and that their institutions have management strategies to enable them achieves appropriate

ICT integration in teaching and learning. At a time when information and communication technologies are being integrated into the classroom as learning tools, and when teachers are being asked to incorporate technology into their teaching practices, principals who are more competent in ICT are more likely to achieve success in their schools.

5.7 Contribution of the study

The study has advised the Ministry of Education comes up with policies that will guide the use of ICT in schools. The government seems to be lagging behind because whereas computer studies has been introduced in secondary schools as part of the national curriculum, it has not kept up with the provision of the necessary infrastructure both physical and human resources. In addition the study advises the government to develop an ICT policy to streamline this important area of learning. The ministry needs to provide ICT teachers to schools and reward those who have the skills and are offering services so as to motivate them. The secondary school owners, head teachers in Buikwe district and the whole country at large have therefore a professional responsibility and accountability to ensure that they are well trained in ICT and that their institutions have management strategies to enable them achieves appropriate ICT integration in teaching and learning.

5.8 Suggestions for Further Research

I suggest a study that will establish how secondary schools in developing countries in general and Uganda in particular apply ICT to enable education for students with special educational needs. Such a study would aim at determining whether secondary schools have fully exploited the potential of ICTs to support the learning needs of students with special learning needs. This comes from the finding that secondary schools are currently, utilizing ICTs to mainly support the dissemination and acquisition of literacy. However, there are suggestions that ICTs have the capacity to be widely applied in special education settings in mainstream classrooms to support learners with special educational.

Further research is also suggested on how ICTs can be monitored so that their use and efficiency in enabling secondary schools is determined. This will ensure that secondary schools do not under or over invest in ICTs. A study on how staff members are instructed and trained on how to assess effectiveness of ICTs in learning and teaching is important to enable the teaching staff to establish how well and where to apply ICTs in teaching.

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SELF-ADMINISTERED QUESTIONNAIRE FOR THE RESPONDENTS WITH KNOWLEDGE ONICT AND EDUCATION PROGRAMMES IN SECONDARY SCHOOLS; BUIKWE DISTRICT

Dear respondent!

I am a student of Uganda Martyrs University pursuing a Master's Degree in Information Communication Technology (ICT) Management, Policy and Architectural Design. This questionnaire is designed to collect information aimed on *the role of ICT in education programmes in the selected secondary schools; a case of Buikwe District - Uganda*. The information obtained will be strictly for academic purposes and it will be treated with utmost confidentiality. I kindly request you to fill this questionnaire. Thank you very much for your time and co-operation

Godfrey Tenywa Angel
Student/Researcher

Section A: Demographic data

(Tick in the appropriate box provided)

1. Your age

Under 25	25-34	35-45	Above 45

2. Gender

Male	Female

3. Marital status

Single	Married	Divorced	Widowed

4. Location of my school/institution

Urban ☐

Rural ☐

5. For how long have you been in this school?

0-3years	4-6years	7-9years	Over 9years

6. What is the highest level of education you have attained?

Certificate	Diploma	Degree	Professional qualification	Masters	PHD

7. For how long have you been accessing ICT facilitates in this school?

  (a) Less than 1 year   (b) 2-3year

  (c) 4-6years   (d) More than 6 years

8. In the course of your studies, did you receive training on Information and Communication

Technology (ICT)? Please indicate duration of course.

Please choose the appropriate response for each item:

Word processing
Spreadsheets
Presentation tools e.g.
PowerPoint
Internet research
Email, chat
Education networks,
Forums
Statistics
E-learning
Databases
Programming

9. In which of the following areas do you use computers in your institution? Tick all that apply

In my office ☐   Staffroom ☐   Computer lab ☐

Classroom ☐   Library ☐   others (specify)……………………………..

10. How often do you use the following ICT resources? Tick where applicable

Equipment	Regularly	Sometimes	Rarely	Not stated
Photocopier				
Desktop computer				
Data projector				
Printer				

SECTION B: THE USAGE LEVEL OF ICT SKILLS BY STUDENTS AND TEACHERS
Evaluate the following statements by writing the appropriate alternative of your choice.

	Statement	Respondent's views
1	What are your main purposes you want to use ICT for with your teachers /students?	
2	What are you focusing on at the moment in the use of ICT?	
3	What is the value in having your Teachers/students use computers?	
4	How does ICT fit into your teaching/ learning overall?	
5	Is there any pattern to your ICT usage? How often do your students/ teachers use ICT? Do they work in groups or independently?	
6	What activities have you used Computers for in the term?	
7	To what tasks have you applied Computers during the term? How have you determined those tasks?	
8	Have you assessed work that students have done with ICT? How has this been included in your overall assessment processes?	
9	In what ways do you connect what the students/teachers do with ICT and the way ICT is used in our society?	

10	What potential do you see ICT to support in teaching and learning processes with your class?	
11	What do you see as your main roles when using ICT in your class? What roles do the students/ teachers have?	
12	In what ways are students/teachers permitted to contribute to decisions about the use of ICT?	
13	What skills do you have in using ICT and what steps do you take to Develop the skills you need?	
14	How do you feel when you use Computers for teaching/learning and when you support others to use computers?	

SECTION C: BARRIERS FACED BY DURING ICT USAGE IN THIS SCHOOL

Evaluate the following statements by ticking the appropriate alternative of your choice.

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1	2	3	4	5

	Statement	1	2	3	4	5
1	No or unclear benefit to use ICT for teaching					
2	Using ICT in teaching and learning not being a goal					
3	Most teachers are not in favour of use of ICT at school					
4	Lack of tutorial frameworks on how to use ICT					
5	Pressure to prepare students for exams and tests					
6	School time organization (fixed lesson time etc)					
7	Too difficult to integrate ICT use into the curriculum					
8	Insufficient technical support for teachers					
9	Insufficient number of computers					
10	Most parents are not in favour of the use of ICT at school					
11	Lack of adequate ICT skills for teachers					
12	School computers are out of date or need repair					
13	Insufficient internet bandwidth speed					

SECTION D: VIEWS ON ICT USAGE IN THE SCHOOL

Approximately what percentage would you assign the availability of the following ICT equipment/facilities in this school? (Indicate the percentage on the space provided).

Equipment/Facility	Percentage	Equipment/Facility	Percentage
Computer labs		Servers	
Multimedia labs		e-content materials	
Data projectors		Electricity backups	
Printers		Computer furniture	

Evaluate the following statements by circling/ticking the appropriate alternative of your choice.

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1	2	3	4	5

	Statement	1	2	3	4	5
1	Teachers do not like using computers in during teaching					
2	Use of social networks is not allowed in our school					
3	The school does not have computers in classrooms					
4	The number of students sharing a computer is very high					
5	The computers are not connected to the internet					
6	Sending and receiving emails is not allowed in our school					
7	I do not have enough skills in computer usage					
8	We do not have enough time to use computers in our school					
9	There are no relevant learning software installed in the computers					
10	There are no relevant learning software installed in the computers					

Thank you for your participation