PROBLEMS IN ICT IMPLEMENTATION IN SELECTED INSTITUTIONS OF HIGHER LEARNING IN KABALE DISTRICT

BY

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DECLARATION

I, Justus Ariho Twinomujuni, do hereby declare that this dissertation is my own original work and has never been submitted to any University or Institution for the award of a degree.

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RESEARCH APPROVAL

This is to certify that this dissertation has been submitted for the award of the Degree of Masters of Education in Information and Communication Technology of Makerere University with our approval as University supervisors.

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DEDICATION

This work is dedicated to Ayebare Robben Kakuru and Ahumuza Rooney Kato.

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ACRONYMS AND ABBREVIATIONS

ACC	African College of Commerce
ANOVA	Analysis of Variance
AvCost	Aggregate variable on Cost of ICT training materials
AvImpl	Aggregate variable on ICT implementation
AvSkil	Aggregate variable on Skills development in ICT
AvSupp	Aggregated variable on administrative support
BBUC	Bishop Barham University College
CD-ROM	Compact Disk -Read On Memory
ICT	Information and Communication Technology
LAN	Local Area Network
MS	Microsoft
MoES	Ministry of Education and Sports
NTC	National Teachers' College
OECD	Organisations of Economic and Co-operative Development
PC	Desk top Computer
RAM	Random Access Memory
SAQ	Self Administered Questionnaire
SPSS	Statistical Package for the Social Sciences
SQL	Structured Query Language
UCC	Uganda College of Commerce
UNESCO	United Nations Educational Scientific and Cultural Organisation

ABSTRACT

Researchers in educational technology have searched for factors to explain teachers' acceptance and resistance to using information communication technology for instruction. This study investigates the influence of cost of ICT training materials, skills development in ICT and administrative support towards ICT implementation in selected institutions of higher learning in Kabale District. A cross sectional survey design was employed and in order to empirically investigate the extent to which problems influence ICT implementation, a self administered questionnaire was administered to a sample of 60 lecturers and 173 students. Interviews were also carried out with 20 administrators from the four institutions. Of the respondents, 62% were male and 32% were female. Observation and documentary review guides were used to obtain information that could not be obtained by use of self administered questionnaire and the interview guide. Using Pearson Linear Co-relation co-efficient, results reveal that cost of ICT training materials negatively influenced ICT implementation where as Skills development in ICT and administrative support positively influenced ICT implementation. This study suggests that ICT implementation in the selected institution of higher learning in Kabale District was minimal. Following the study findings, recommendations were made to encourage stakeholders to explore the possibility of being trained on how to use computers in teaching rather than operating computers. Further research is thus recommended on the replica of this study to be conducted in other institutions of higher learning in other districts in Uganda. Research could be conducted on other variables such as lecturers' perception, and individuals' characteristics, students' ICT skills, and attitude that may affect ICT implementation in institutions of higher learning in Uganda.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

This background was categorised into four perspectives, namely; historical, theoretical, conceptual and contextual: This chapter also presents the statement of the problem, purpose, specific objectives, hypotheses, scope and significance of the study.

1.1.1 Historical Perspective

Educational systems around the world are under increasing pressure to use Information and Communication Technology (ICT) to teach students the knowledge and skills needed in the 21st century (Omwenga, 2007). Development and application of ICT in African institutions of higher learning is critically important if the continent is to reduce the knowledge, technological and economic gaps between itself and the rest of the world (Farrell and Shafika, 2007). According to Farrell (2007), Uganda developed its initial National ICT Policy in 2003 with its main objective of integrating ICT into educational curricula as well as other literacy programmes to provide for equitable access for all students regardless of the academic level. With the establishment of a Ministry of ICT in Uganda in 2006, various policies were developed in the Ministry of Education and Sports (MoES), for example, ICT policy on education for primary and secondary schools which aims at training teachers in ICT skills, is in operation. In tertiary education, ICT policy is not particularly integrated and initiatives are taken on an individual institutional basis with the Ministry and /or with other partners. 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 (Magambo, 2007).

Researchers in the past have had interest in ICT implementation in several ways. For example, Salih (2004) studied factors affecting the application of ICT in distance education in Turkey whereas Bagchi and Godwin (2007) looked at factors that drive adoption of ICT in Africa and in the Organization of Economic and Cooperative Development (OECD) set of nations. Peansupap and Walker (2005) looked at factors enabling ICT diffusion and actual implementation in large construction organizations in Australia. Tusubira and Mulira (2004) assessed the integration of ICT in organizations, challenges and best practice recommendations based on the experience of Makerere University. Katushabe and Kisambira (2002) studied ICT based educational content on Kyambogo University and its affiliated NTCs; whereas Mulamira (nd) assessed utilization of electronic resources by academic staff of Makerere University. Bakkabulindi (2008) considered individual characteristics affecting use of computers in Makerere University whereas Odongo (2007) looked at ICT integration and its influence on teaching process in selected secondary schools in central Uganda. No studies had been undertaken on studies relating problems in ICT implementation in selected institutions of higher learning in Kabale District, a gap this study endeavored to close.

Mugisha (2007) conducted a survey on problems related to ICT implementation in the curriculum of Core Primary Teachers' College in Kabale District. The selected problems in the study were on tutors' attitude towards ICT, their ICT use in teaching, and the availability of ICT. Much as the study considered problems related to ICT implementation, the population studied

consisted of only tutors in core primary teachers' college and thus leaving a gap to be closed by this study by considering lecturers and students in other tertiary institutions in Kabale District. Analysing the data quantitatively and qualitatively, Akankwasa (2008), studied teachers' attitudes, skills and behaviours related to ICT use at Christian University, Mukono. To find out the relationship between variables, data was analysed using Pearson chi-square. This study therefore is deemed wanting to use another method of analyzing data which the previous study did not explore. Munyantware (2006) studied problems affecting teacher's adoption of ICT in secondary schools in Kisoro District. In the study, Munyantware found out that teachers' technological skills were critical for successful ICT implementation in the classroom. However, the study targeted only science and mathematics teachers in secondary schools and thus, leaving a gap for this study to close by investigating the extent to which problems (i.e. cost of ICT training materials, skills development in ICT and administrative support) influence ICT implementation in institutions of higher learning in Kabale District.

1.1.2 Theoretical Perspective

This study viewed ICT implementation as an example of innovation adoption and thus invokes one innovation diffusion theory, Rogers' (2003) Perceived Attributes Theory which stipulates that if the perceived advantage to the use of an innovation is positive, there is a greater likelihood that it will be adopted rapidly. The perceived attributes are the characteristics of innovation that have an impact on the likelihood of acceptance and adoption, and also on the rate at which this process develops. Innovation attributes supporting diffusion are: relative advantage, compatability, complexity, observability and trialibility. Rogers (2003:229) defines relative advantage as "the degree to which an innovation is perceived as being better than the idea it

supersedes". The cost and social status motivation aspects of innovations are elements of relative advantage. For instance, while innovators, early adopters, and early majority are more status-motivated for adopting innovations, the late majority and laggards perceive status as less significant. Moreover, Rogers categorized innovations into two types: preventive and incremental (non-preventive) innovations. "A preventive innovation is a new idea that an individual adopts now in order to lower the probability of some unwanted event" (Rogers, 2003:233). Preventive innovations usually have a slow rate of adoption so their relative advantage is highly uncertain. However, incremental innovations provide beneficial outcomes in a short period. When faculty members face the new demands placed on them, they will adopt ICT. If teachers see that ICT has value in their instruction, then they will use it (Sahin, 2006). To integrate ICT successfully into higher education courses, teacher education faculty should see the need for providing helpful experiences for themselves and their students (Mugisha, 2007). To increase the rate of adopting innovations and to make relative advantage more effective, direct or indirect financial payment incentives may be used to support the individuals of a social system in adopting an innovation.

Rogers (2003:15) states that "compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters". Lack of compatibility in ICT with individual needs may negatively affect the individual's ICT use (Sahin, 2006). Akankwasa (2008) stated that each innovation influences teachers' opinions, beliefs, values, and views about teaching. If an innovation is compatible with an individual's needs, then uncertainty will decrease and the rate of adoption of the innovation will increase. Rogers (2003:15) defines complexity as "the degree to which an innovation is perceived as

relatively difficult to understand and use". As Rogers stated, opposite to the other attributes, complexity is negatively correlated with the rate of adoption. Thus, excessive complexity of an innovation is an important obstacle in its adoption. A technological innovation might confront faculty members with the challenge of changing their teaching methodology to integrate the technological innovation into their instruction (Munyantware, 2006), so it might have different levels of complexity. This suggests that if computer hardware and software are user-friendly, then they might be adopted successfully for the delivery of course materials. According to Rogers (2003:16), "trialability is the degree to which an innovation may be experimented with on a limited basis". Also, trialability is positively correlated with the rate of adoption. The more an innovation is tried, the faster its adoption is. Then, the innovation may be changed or modified by the potential adopter. Increased reinvention may create faster adoption of the innovation, which is especially helpful for later adopters. However, Rogers stated that earlier adopters see the trialability attribute of innovations as more important than later adopters.

Rogers (2003:16) defines observability as "the degree to which the results of an innovation are visible to others". Role modeling (or peer observation) is the key motivational factor in the adoption and diffusion of ICT (Munyantware, 2006). Similar to relative advantage, compatibility, and trialability, observability also is positively correlated with the rate of adoption of an innovation. In summary, Rogers (2003) argued that innovations offering more relative advantage, compatibility, simplicity, trialability, and observability will be adopted faster than other innovations. Rogers does caution, "getting a new idea adopted, even when it has obvious advantages, is difficult", so the availability of all of these variables of innovations speeds up the innovation-diffusion process. Adopters tend to have greater risk tendencies and the higher the

risk, the shorter the rate of diffusion of a typical innovation. Research showed that all these Problems influenced faculty members' likelihood of adopting a new technology into their teaching. Using Rogers' theory, Kim (1999) found out that where there is an uncertainty, confusion and support problem, an innovation becomes incompatible, complex and intimidating. Adopters tend to have greater risk tendencies and the higher the risk, the shorter the rate of diffusion of a typical innovation. Adopting Rogers' (2003) perceived attributes and innovation characteristics, the current study considered cost of ICT training materials, skills development in ICT and administrative support as possible problems influencing ICT implementation in selected institutions of higher learning in Kabale District

1.1.3 Conceptual Perspective

In this study, the dependent variable is ICT implementation. ICT is an umbrella term that includes all technologies for the communication of information (Brock, 2000). For the purpose of this study, ICT was used to refer to computers in computer laboratories on campus, which are primarily designated for student use. Surry and Ely (2001) define implementation as the process of introducing an innovation into an organization and fostering its use. In an information technology context, implementation encompasses all the processes involved in getting new software or hardware operating properly in its environment, and making necessary changes. The independent variable in this study is problems. The Free Online Dictionary (nd) defines problems as situations that hinder the accomplishment, result, or process. In this study problems that were considered are; cost of ICT training materials, skills development in ICT, and administrative support. Cost of ICT training materials in this study refers to price paid to have computers and related peripherals in place. Skills development in ICT in this study refers to special ability (or

expertise) enabling one to perform an activity by using a computer and its related peripherals in either teaching or learning. Administrative support refers to the help and guidelines given out by administrators in institutions of learning to aid computer training and integration of ICT into the curriculum.

1.1.4 Contextual Perspective

According to Bakkabulindi (2008) and Republic of Uganda (2002, 2007), most institutions of higher learning in Uganda, both tertiary and universities, depended on manual systems, with little use being made of computers in teaching, admission, examination, registration, students' records, finance and accounting. In addition, internet access and e-mail applications were minimal and what was on the ground were desk computers for office work and other general applications. Waite (2004, cited in Malcolm and Godwilly, 2008) indicate that even though teachers showed great interest and motivation to learn about the potential of ICTs, in practice, the use of ICT is relatively low and it is focused on a narrow range of applications, with word processing being the predominant use. The application of other ICT tools such as video conferencing, emailing and the Internet was rare. Moreover, institutions of higher learning are still using old versions of software, black board and textbooks in teaching.

The implementation of ICT to enhance and extend teaching and learning across a wide range of subject areas has proved challenging to many institutions of higher learning in Uganda, and understanding the issues regarding encouragement, support and infrastructures required to achieve this has proved to be complex. However, there are some institutions where majority of staff have adopted ICT use into their working practices, adapting existing approaches to teaching

and learning and developing new ones. In other institutions with apparently similar desire for ICT to be used, and similar resources, only pockets of limited ICT use has been achieved.

Kasozi (2003) carried out a study on ICT issues in Uganda's education sector on Information and Communication Technology (ICT) implementation in the central region. His findings and conclusions were that there are still many problems facing ICT spread in the education sector. He highlighted the problems as initial capital being prohibitive and lack of technical personnel. However, it should be noted that he investigated the level of computer literacy and competence among employees in the education sector. He did not investigate ICT implementation in institutions of higher learning. This renders his study of little use for enhancement of learning with ICT in institutions of higher learning in Kabale District. However, such studies dealt only with training skills and availability of resources affecting ICT implementation in institutions of higher learning and none was on Kabale District for which gap this study intended to close.

1.2 STATEMENT OF THE PROBLEM

Diffusion of ICT through organisations needs to be effectively managed to better prepare for future ICT application adoption (Markus, 1987). The forces that have driven institutions of higher learning to adopt and incorporate ICT in teaching and learning include greater information access; greater communication, synchronous and asynchronous learning, increased cooperation and collaboration, cost-effectiveness and pedagogical improvement (Surry and Ely, 2001). ICT can be integrated into curriculum delivery through use of e-learning, video conferencing, electronic platforms, World Wide Web and open source software.

Much as investment in ICT continues to increase, information communication technologies such as computers; video players and projectors have not been effectively used into lecture rooms in institutions of higher learning in Kabale District. Most teachers do not use these ICTs in lecture room as frequently in institutions of higher learning as policy makers and researchers expect. Institutions of higher learning like Makerere University, Kyambogo University, Mbarara University of Science and Technology, Uganda Martyrs University, Nkozi have tried to integrate ICT into teaching and learning environments, but they have faced a problem of high costs in purchasing ICT tools and maintenance (Farrell, 2007).

And yet, failure to access and adopt information and communication technologies and knowledge critically has hindered sustainable progress for individuals and communities as we enter the 21st century (Katundu, 2000). While several studies had documented minimal ICT implementation in institutions of higher learning, ICT implementation had been studied under different perspectives (e.g. attitude, time, age, motivation and income) and none had been in the context of Kabale District. While there could have been several contributing problems; cost of ICT training materials, skills development in ICT, and administrative support may have played a major role in affecting ICT implementation in institutions of higher learning in Kabale (Rogers 2003). Hence the need for this study to establish problems influencing ICT implementation in selected institutions of higher learning in Kabale District.

1.3 PURPOSE

The purpose of this study is to explore the extent to which training problems influence ICT implementation in selected institutions of higher learning in Kabale District.

1.4 OBJECTIVES

The specific objectives of the study were;

i. To investigate the influence of cost of ICT training materials on ICT implementation in selected institutions of higher learning in Kabale District.

ii. To find out the influence of skills development in ICT towards ICT implementation in selected institutions of higher learning in Kabale District.

iii. To explore the influence of administrative support on ICT implementation in selected institutions of higher learning in Kabale District.

1.5 HYPOTHESES

The research sought validity or otherwise of the following hypotheses;

$H0_1$: Cost of ICT training materials does not enhance ICT implementation in the selected institutions of higher learning in Kabale District.

$H0_2$: Skills development in ICT does not enhance ICT implementation in the selected institutions of higher learning in Kabale District.

$H0_3$: Administrative support does not enhance ICT implementation in the selected institutions of higher learning in Kabale District.

1.6 SCOPE

Geographically, the study concentrated on selected institutions of higher learning in Kabale District, Uganda where ICT implementation was reported to be minimal (Bbakkabundi, 2008, Republic of Uganda, 2003). Due to limited resources (e.g. time and finance), the researcher considered only four institutions of higher learning out of 12 namely; Kabale University, Bishop

Barham University College (BBUC) Kabale, Uganda College of Commerce (UCC) Kabale, and National Teachers' College (NTC) Kabale. The researcher used purposive random sampling in selecting the four institutions. In content, the study focused on three problems i.e. cost of ICT training materials, skills development in ICT and administrative support affecting ICT implementation. The sample population consisted of administrators, lecturers and final year students because these are the group that dealt with ICT in their areas of operation and studies. The study was carried out for 14 months from October, 2008 to December, 2009

1.7 SIGNIFICANCE

The study could provide vital information to the Ministry of Education and Sports (MoES), educational partners, and management of institutions of higher learning in Uganda to establish how cost of ICT training materials, skills development in ICT and administrative support may be positively or otherwise affecting ICT implementation, and hence be in a position to adjust appropriately. Management of institutions of higher learning in Uganda would be able to identify both administrative and technical bottlenecks and measures of dealing with them in prompting ICT implementation among their staff. Knowledge gained from this research study would be useful to educators and policy makers like National Council for Higher Education (NCHE) in making wise decision in relation to their ICT investment. Theoretically, the study would also prompt more researchers in the area having contributed to literature for future studies.

CHAPTER TWO

LITERATURE REVIEW

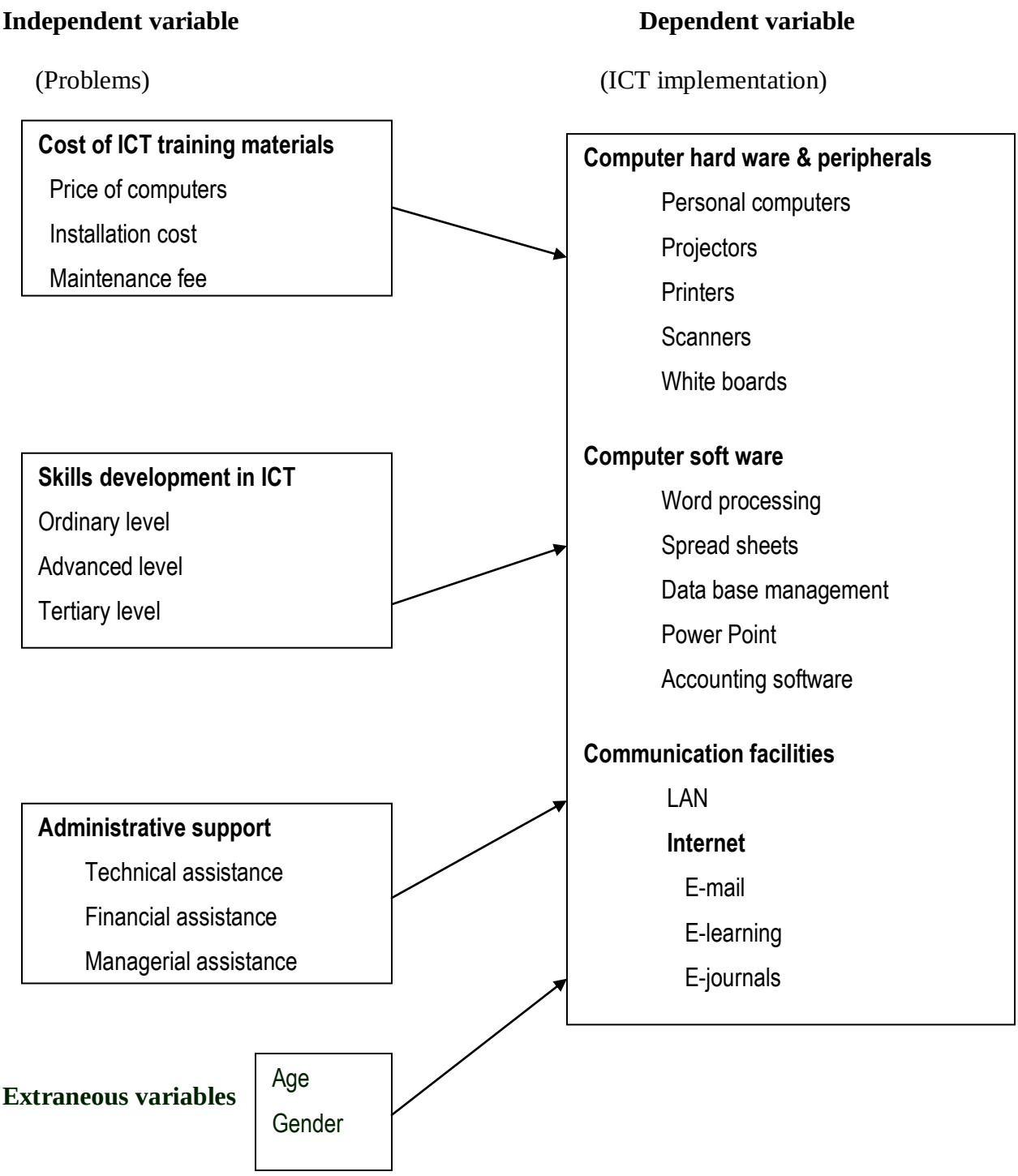
2.0 INTRODUCTION

This chapter gives the conceptual framework and literature review related to the three respective objectives of the study. These variables are; cost of ICT training materials, skills development in ICT and administrative support in relation to ICT implementation.

2.1 CONCEPTUAL FRAMEWOK

The framework in Fig. 2.1 illustrates that the independent variable is conceptualized as three problems namely; cost of ICT training materials, skills development in ICT and administrative support. The dependent variable, ICT implementation is conceptualized as use of computer hardware, application of computer software and computer communication facilities. Most of the concepts (e.g. cost of ICT training materials, skills development in ICT, administrative support, computer hardware, computer software and communication facilities) are conceptualized as shown in Fig. 2.1. It was hypothesized that the two problems (skills development in ICT and administrative support) have a positive relationship with ICT implementation whereas cost of ICT training materials has a negative relationship with ICT implementation. Consequent to the review of Rogers' (2003) Perceived Attributes Theory (Section 2.1), Fig. 2.1 provides a framework, relating the variables in the study.

Fig .2.1 Conceptual framework relating problems influencing ICT implementation.



Adopted from E. Rogers (2003), Diffusion of Innovations. (5th ed), p 229-233.

2.2 RELATED LITERATURE

This section reviews literature related to the three specific objectives in this research i.e. cost of ICT training materials, skills development in ICT, and administrative support.

2.2.1 Cost of ICT training materials and ICT implementation

According to the Free Online Dictionary (nd), cost refers to an amount paid or to be paid for a purchase to acquire, produce, or maintain goods or services. Implementation according to this study refers to the application of ICT in societies. The cost of ICT training materials was considered to be among the problems that could negatively affect the implementation of ICT in institutions of higher learning in Kabale District. The higher the cost of computers and their accessories, the fewer computers one can buy with the limited resources (Republic of Uganda, 2007; Sharma, 2003). According to Tusubira and Mulira (2004), the cost of a Desk top Computer (PC) connected to the Internet is often prohibitive for most people in developing countries and for those who can afford a PC, routine maintenance, virus protection and servicing, is yet another problem that is not easily manageable by the first generation computer users. Compared to traditional forms of off-campus learning, technology facilitated has proven to be quite expensive in all areas of consideration, infrastructure, course development and course delivery (Oliver, 2002).

Empirical studies on the relationship between cost of ICT training materials and ICT implementation are many. For example Makau (1986) established that financial resources form a key factor to the successful implementation and integration of ICT in higher education in Kenya. Mumtaz (2000) reported limited resources within schools as a great impediment to the take up of

ICT and lack of computers and software in the classroom can limit what teachers are able to do with ICT. Zziwa (2001) in his paper on networking and use of information technologies in the French education system also reported that the main obstacle to utilising computers in schools is the high cost of computer peripherals. Aduwa-Ogiegbaen and Lyamu, (2005) established high cost of hardware and software applications, as one of the problems hindering integration of ICT in learning and teaching in Nigerian secondary schools, while another study Tusubira and Mulira, (2004) focusing on the challenges of integrating ICT in enterprises reported that financial resources to buy computers and software relative to the perceived benefits, in the experience of Makerere is a secondary consideration.

Developing countries have a significantly lower rate of diffusion and use of ICT than developed countries (Sharma, 2003). Malcom and Godwyl (2008) in the study, diffusion of information communication technology in selected Ghanaian secondary schools reveals that one fundamental problem facing ICT implementation in schools is high cost price of computers and lack of computer infrastructure. However, Ensafi et al (2007) reported that the main obstacles in the growth of e-learning in Iran is not the high price of computers, but rather the lack of government budgets for equipping universities, schools and public places with new computers and suitable hardware infrastructure. Getting computers into universities and institutions is relatively easy but keeping them up and running is a greater challenge. The research further showed that in most developing countries laboratory coordinators in some institutions of higher learning are not skilled enough in resolving technical problems. According to Aryatuha (2007), most of the African economies are so poor and where ICT is introduced the competency to handle it is very low since the capacity to train staff is limited because of lack of enough resources.

It is believed that successful use of ICT in institutions of higher learning is hampered by high cost of ICT tools. The price of computer hardware and software continues to drop in most developed countries, but in developing countries such as Uganda, the cost of computers is several times more expensive due to high levels of poverty and inadequate funding (Sife et al, 2007). In support of this statement, it was reported that while a desk top computer may cost less than a month's wage in the USA, the average worker in developing countries may require more than six months' wage to buy one. The study further revealed that, apart from the basic computers themselves, other costs associated with peripherals such as printers, monitors, projectors, modem, and extra disk drives could be beyond the reach of some institutions of higher learning in most developing countries.

Ssewanyana and Busler (2007) in their study, adoption and usage of ICT in developing countries, stated that usage of computers and internet is high in medium and large firms, and especially firms owned by foreigners. The small firms which are mainly locally owned, have low usage due to the high cost of required investment, limited knowledge and skills, and being very responsive to charges. The findings suggest that there is need to widen ICT training facilities for the local entrepreneurs to take advantage of opportunities associated with the adoption of ICT; and to address charges on the Internet services and other ICT consumables to lower the cost of acquisition. The findings further indicate that people do appreciate the contribution of ICT to the performance of their firms, but the various barriers such as high costs of hardware, software, Internet and ICT professionals among others are a hindrance to their progress. One has to undergo vigorous training in order to become a computer knowledgeable individual, however, high cost of ICT training materials would hamper this process. Though many researchers

advocate for the use of computers in management activities, there are quite a number of problems which affect the effective utilization of computers. In agreement with the statement, Zziwa (2001), in his paper on networking and the use of information technologies, pointed out that computer utilization is affected by training, organization, and supply of resources. With reduced costs on ICT tools, adoption of ICT innovation could be advantageous over other innovations. According to Namukangula, (2007), in Makerere University, all departments, institutes, faculties and schools have included the acquisition of more computers, the setting up of local area networks, technical assistance and training of staff in their strategic plans, however, much as there are such efforts in universities, ICT implementation has not taken a firm foundation among staff and students. This could be as a result of high costs in purchasing computers and related peripherals, negative attitude of lecturers towards using computers in teaching. This indicates that when the cost of ICT training materials is high, ICT implementation in institutions of higher learning tend to be minimal and vice versa. High cost of ICT training materials could be assumed a barrier to teaching using computers in institutions of higher learning in Kabale District. However, this assumption remains a theoretical one until it is proved and thus the need for this study to establish the extent to which cost of ICT training materials influences ICT implementation in institutions of higher learning in Kabale District.

While most studies above show that the cost of ICT training materials pose a challenge to the adoption of ICT, Tusubira and Mulira (2004) and Ensafi et al, (2007) seem to be taking a different position of considering cost of computer as a less important factor. According to Tusubira and Mulira (2004), Cost of ICT training materials was not taken as a major inhibitor of ICT implementation in institutions of higher learning. They considered lecturers' awareness and

positive attitude towards ICT as necessary conditions for effective ICT implementation. They urged that institutions of higher learning in Uganda could adopt freeware and open software for teaching and learning activities. Much as most studies above were concerned with cost of ICT training materials, the population studied was different. For example, some studies were concerned with secondary school teachers while others considered only post graduate lecturers like Malcom and Godwill (2008) for secondary schools and Namakungula (2007) for post graduate lecturers. Further more such studies were in line with other institutions of higher learning like Makerere University, Kyambogo University, Iranian University and none was related to any institution of higher learning in Kabale District. To contribute to the closure of this gap, this study needed to investigate the effect of cost of ICT training materials towards ICT implementation in higher institutions of learning in Kabale District.

2.2.2 Skills development in ICT and ICT implementation

Hornby (2006) defines skill as the ability to do something well. Skills development in this study will refer to special ability (or expertise) enabling one to perform an activity by using a computer efficiently and its related peripherals in either teaching or learning. Dalton (1998) asserts that training is directed at changing people's knowledge, experience, skills and attitudes. The scarcity of adequately trained and experienced analysts, software engineers, systems and network managers, restrains ICT development in Uganda.

Several studies have attempted to relate adoption of skills development in ICT. For example, Bates (1997) reported lack of training and skills as obstacle to ICT use in institutions of higher learning in Tanzania, while Agaba (2003) found lack of skills as one of the problems explaining

underutilization of Makerere University Library electronic information resources by academic staff. Farrell (2007) established that, though the Faculty of Computing and Information Technology at Makerere University trains staff in e-learning and support e-learning in the whole university, comparatively few teachers have the skills to make pedagogical use of ICT for teaching across the curriculum. This could be due to inadequate ICT training skills, lack of time and negative attitude by teachers towards ICT implementation. Peansupap and Walker (2005) found lack of ICT skills as a key barrier to adopting and using ICT applications in Australian construction organizations. Hawkins (2002) established that most teachers in the developing world are intimidated by technology and are thus comfortable with their own old teaching styles.

Furthermore, Mooij and Smeets (2001) in the study aimed to investigate the implementation of ICT and its support within the secondary schools in Holland found that teachers' competence and confidence in their skills were one of the main factors to influence teachers' willingness to integrate technology in their teaching-learning process. They claimed that educator's lack of knowledge is a serious hindrance to integrate ICT into secondary schools. Educators' must attain and maintain an assured degree of technological competence to make instructional strategies more effective**.** This is supported by Albirini (2006) who stated that technology competence comprises not only technology knowledge but also the skills and experience essential to put them into use. Technology competency allows the teachers to turn into most efficient individuals in dealing with daily tasks such as to communicate with the student's parents; to keep records; to do research in their option domain; and to prepare presentations (Priscilla et al, 2008). Computer competence, therefore, can be observed in terms of teachers' beliefs concerning their knowledge, basic skill, and capability of performing essential functions using the computer. According to

Albirini (2006), computer competence refers to educators' beliefs about their computer knowledge and skills. Computers are an essential part of many work places and employers need both men and women with computers skills. Although some come to the job with computer related education, many workers need training or retraining to keep up with new computer hard ware or software (Busch, 1996).

Krysa, (1998) stated that computer training should not be limited to teachers who teach computing but to all teachers on the use of computers. The need for computer training is explained by the fact that most of the presently recruited teachers received little or no training in their formal education concerning use of computers in teaching. It could also be a reflection of the need to update teachers' knowledge in the world of fast moving technology of communication. Training all teachers on the educational use of computers gains special importance when considering integrating the computer into regular curriculum. Teachers need to know how to use computers first before they can integrate them in the curriculum. This could make ICT innovation simple to adopt and implement as the innovation becomes compatible with the current objectives of the users. Krysa (1998) points to professional development and training as a solution to successful ICT implementation. According to Schaffer and Richardson (2004, cited in Afshari et al, 2009), when technology is introduced into teacher education programs, the emphasis is often on teaching about technology instead of teaching with technology. Hence, inadequate preparation to use technology is one of the reasons that teachers do not systematically use computers in their classes. Teachers lack the necessary skills and thus need to be given opportunities to practice using information communication technology during their teacher training programs so that they can see ways in which technology can be used to augment their

classroom activities (Afshari et al, 2009). Teachers are more likely to adopt and integrate ICT in their courses, when professional training in the use of ICT provides them time to practice with the technology and to learn, share and collaborate with colleagues. The statement suggests that training teachers to update their ICT skills may aid the integration of computers into the classroom setting. To promote ICT integration in schools, school leaders should adopt strategies that make ICT part of the daily routine or tasks of the teachers. These strategies may include using e-mail as the mode of communication among staff, accessing the intranet to download data and using a word-processor to complete lesson plans for submission. Much as training in ICT is emphasized, ICT implementation in institutions of higher learning in Kabale District was reported to be minimal and one wonders what could be the logic behind this.

Knowledge creation and the ability to translate ICT skills and knowledge to the benefit of society are critical. ICT skills are required for empowerment to enhance value and create opportunity through new technologies. Human capital must be developed through training, research and capacity building. However, organizations such as universities and institutions of higher learning, research centers, polytechnics and training centers in most developing countries are affected in this area. Ensminger et al (2004) found that low levels of skills and the need to train users influenced ICT implementation. Dalton (1998) emphasized the importance of training for the adoption and diffusion of computers in schools. Malcolm and Godwyl (2008) reported that lack of professional development programs for teachers to upgrade their skills on emerging technologies is a hindrance to ICT implementation.

The effective use of computers by teachers depends not only on their attitudes, but also on the training they have received (Afshari et al, 2009). Teachers' competence presupposes: positive attitudes to ICT, understanding of educational potential of ICT, ability to use ICT effectively in the curriculum and ability to manage ICT use in the classroom. However, Bauer and Kenton (2005) stated in their study that although teachers were having sufficient skills, were innovative and easily overcame obstacles, they did not integrate technology consistently both as a teaching and learning tool. Reasons being outdated hardware, lack of appropriate software, technical difficulties and student skills levels. The study found that professional development has a significant influence on how well ICT is embraced in the classroom. This implies that teachers' training programmes often focus more on basic skills and less on the integrated use of ICT in teaching. Despite the numerous plans to use ICT in schools, teachers have received little training in this area in their educational programs.

According to a UNESCO (2005) survey, about 35% of the already trained teachers in secondary schools in Europe, Asia and Africa have basic skills in ICT, which leaves 65% of the teaching workforce on the three continents still in need of computer skills (Auerswald and Magambo, 2007). UNESCO (2005) reported that teachers, professors, technical and administrative staff must be given training that enables them to integrate new information and communication technologies into their teaching programs. The lack of technical skills of maintaining the functionality of computers confused teachers to integrate ICT in the classroom (Priscilla et al, 2008). Numerous problems related to ICT infusion occur among the teachers due to the "lack of technical skills and knowledge of maintaining the functionality of the computers".

According to Pelgrum (2001, cited in Afshari et al, 2009), the success of educational innovations depends largely on the skills and knowledge of teachers. The study reported that teachers' lack of knowledge and skills is among the most inhibiting obstacles to the use of computers in schools. Similarly, in the United States, Knezek and Christensen (2000) reported that educators with higher levels of skill, knowledge, and tools would exhibit higher levels of technology integration in the classroom. Berner (2003, cited in Afshari et al, 2008) in a case study on the relationship between computer use in the classroom and two independent variables: beliefs about computer competence; and administrative support, found that the faculty's belief not computer competence was the greatest predictor of their use of computers in the classroom. Therefore, teachers should develop their competence in ICT skills through training based on the educational goals they want to accomplish in order to use computers in teaching.

Another obstacle to utilising computers in teaching is lack of computer knowledge for persons handling computers. Teo and Lim (1998) reported that competence of individual teachers handling computers is very low; most of them lack both educational and technical training. Research findings indicated that there is need to equip teachers with computer technology skills and knowledge through effective training on how to use computers in teaching. Hsin-Kai, et al (2007), reported that teachers' technological skills (e.g. technology proficiency and computer literacy) are critical for successful implementation of ICT in the classroom. Teachers should understand the enabling conditions of certain technologies in order to engage students in ICT-based learning activities successfully. Teachers who have lower ICT proficiency are usually not willing and have less confidence to use ICT for teaching (Windschitl and Sahl, 2002). Teachers who have strong engagement towards their own professional development are more motivated to

undertake activities which lead to a better understanding of the goals of an innovation. However, much as training is emphasized by Ministry of Education and Sports in Uganda, ICT usage is still low. This indicates that skills development may not alone effectively influence ICT implementation and thus, one wonders the role of skills development towards ICT implementation in institutions of higher learning in Kabale district.

Afshari et al (2009) pointed out that teachers who are actively involved in their professional development are able to implement changes in their teaching. For example, formal certification of in-service professional development that leads to diplomas or degrees in ICT could provide and update their skills in and knowledge of ICT integration. Teachers need follow–up training sessions to ensure that they keep abreast with current ICTs and have a clear understanding of what to change as well as how to change. In order for ICT to be effectively incorporated into teacher preparation programs, teachers should complete a well planned sequence of courses and experiences that will help them understand and apply ICT in education.

Integration of ICT in teaching and learning does not only deal with introduction of new hardware and software, but both trainers and students have to adopt new roles and change their behaviours and ways of teaching. Farrell (1999, cited in Sife et al, 2007) reported that ICT training and workshops are needed not only to improve the skills of the instructors, but also as a means of getting them involved in the process of integrating ICT in teaching and learning. Nachmis et al (2004) stated that staff training should be a continuous process for regular updates with the development of ICTs. Faculty staff require ICT training not just in the choice and use of appropriate technologies, but on how people learn and in instructional design (Bates, 1997).

Therefore, teachers need to be trained on educational technologies and the integration of computers into the classroom teaching. Teachers also need effective tools and techniques and assistance that can help them develop computer based projects and activities especially designed to raise the levels of teaching in required subjects and improve student learning.

Continuous professional development for teachers will be needed as computers continue to be used in teaching at an increasing rate (Odongo, 2007). Computers require maintenance and budgets are essential because without maintenance, schools will quickly become huge digital burial grounds. A computer with more sophiscated software will not be effectively used without trained teachers to operate it. Teaching students how to use word, spreadsheets, databases and graphic tools is a safe way to bring computers to schools since these are the productive tools required later on in life. Installing the software is a task beyond the capabilities of most institutions of learning that lack ICT experts. Acquisition of ICT skills could make the innovation easy to be tried by teachers in their teaching and where the innovation is more observable than others, adoption and implementation by individual teachers becomes quicker. Despite developments in the use of ICT in tertiary institutions and universities in Uganda, tertiary institutions in rural areas still lag behind compared to their urban counter parts in urban areas such as Kampala (Republic of Uganda, 2007). Many of the tertiary institutions in Uganda have tried to progress in their implementation of ICTs, but they have relied mostly on donor funding (Braak, 2001). One wonders what will happen when donor aid ceases. This suggests that ICT implementation in institutions of higher learning could be caused by a variety of problems and thus, need for this study to investigate the extent to which skills development in ICT influenced ICT implementation in institutions of higher learning in Kabale District.

While all the majority of above studies showed positive correlation between skills development and adoption of ICT, and indeed some were on the context of institutions of higher learning, none was on the context of Kabale District. For example, Ssewanyana and Busler (2007) considered adoption and usage of ICT in developing countries targeting skills development and top most taxpaying firms in Uganda. Much as the such study was concerned with Problems influencing ICT implementation, the population studied was different and thus leaving a gap for this study to close by investigating problems influencing ICT implementation in institutions of higher learning in Kabale District. However, few studies such as Bauer and Kenton (2005) were of the view that possessing ICT skills cannot guarantee effective use of computers in teaching. Munyantware (2003) in his study, problems affecting adoption technology by mathematics and science teachers in secondary schools found out that teachers with lower ICT proficiency are not willing and have less confidence to use ICT for teaching. This suggests that teachers' information communication technological skills are critical for successful ICT implementation in the classroom. Much as the study findings were in the context of Kabale District, it only covered teachers' affection, abilities and skills and thus cost of ICT training materials and administrative support problems were not covered. In addition, the study dealt only with mathematics and science teachers in secondary school leaving a gap for lecturers in institutions of higher learning in Kabale District not catered for. Thus, the need for this study to investigate the extent to which skills development in ICT influenced ICT implementation in selected institutions of higher learning in Kabale District.

2.2.3 Administrative support and ICT implementation

Soanes (2006) defines administrative support as an act of giving out or applying something in an organisation. Administrative support in the context ICT refers to the presence of encouraging ICT-using role models, such as the principal, and the presence of incentives for teachers to use technology (Priscilla et al, 2008). In this study, administrative support refers to the help and guidelines given out by administrators in institutions of higher learning to aid in computer training and integration of ICT into the curriculum. Sife et al (2007) reported that administrative support is critical to the successful integration of ICTs into teaching and learning processes. It can be argued that administrators can provide the conditions that are needed, such as putting in place an ICT policy, incentives and resources.

Sife et al (2003) stated that for the adoption of ICTs to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, pedagogical, administrative, financial, and social dimensions of ICTs in education. For any institution to adapt to new innovations there must be a back up from administrators (Tusubira and Mulira, 2004). Priscilla et al (2008) stated that guidance from a head of department is very important in encouraging the development of electronic lesson materials to encourage computer use for the specific subject in the teaching-learning environment. The study found out that the success of integrating ICT into the teaching-learning interaction among school teachers depends on the support provided by the principal of the school.

Several past studies had tried to relate administrative support and ICT implementation. For example, Cameron and Ulrich (1986) found lack of administrative support as a barrier to adoption of innovation in the Nigerian education system. Mumtaz (2000) and Sife et al (2007) established lack of administrative, technical and financial support as problems that prevent teachers from using computers in their teaching. Hawkins (2002) reported that school administrators offer very little structural support and incentives to teachers to effectively use ICT in the classroom. Though lecturers enthusiastically engage in collaborative projects and constructivist pedagogy, administrative support given in reference to ICT is not adequate. Teachers use computers more often for their teaching-learning process if they perceived an adequate support from the school administration (Kariuki, 2004). Teachers who receive adequate ICT support from the administrators are more likely to use ICTs in their teaching practice while those who don't receive ICT support from the higher authorities in school are less enthusiastic in using computer or do not integrate technology at all. Administrators in school, such as the principal acts as a mediator to integrate ICT into the educational system by playing a key role in encouraging, supporting, and helping the teachers to use computers in their teaching-learning process. The support of the school principal or administrator can encourage and promote teachers' willingness to use the computer as a medium to deliver instruction. Thus, the role of the school administrator is crucial in providing the force, support and conditions to enhance the use of computer in the teaching profession. Much as administrative support is an important factor in positively influencing ICT integration, ICT implementation in institutions of higher learning in Kabale was still minimal and thus, need for this study to investigate the influence of administrative support towards ICT implementation.

Technology support has a positive impact on educators' own uses of technology, and their integration of ICT into the teaching-learning process. Technical support has been viewed as one of the facilitating conditions that can influence computer usage. Yang (2008) reported that lack of technical support as one of the major barriers that resulted in computers being underutilized in the classes. Teachers do not use computers in teaching when they are not sure where to turn for help in case something goes wrong. On the other hand Afshari et al (2009) stated that schools should work to convince ICT staff on how ICT integration in classrooms is very important. Ministry of Education and Sports should encourage Schools to purchase highly reliable technologies; improve systems for checking and maintaining ICTs in the classroom. This could be done by creating new approaches (including staff training) to guarantee that extremely rapid responses are made to breakdowns.

In a study of small firm computing, Teo and Lim (1998) found that lack of technical support often discourages ICT growth. Technical support may be provided to teachers by equipping them with technical skills on how to handle computer hardware and software. Afshari et al (2009), indicated that with information technology support, teachers are able to access school network, internet and computer accessories (printer, digital camera, data projector, large TV screen, scanner and video camera). They also reported that as beginners of computer use, teachers need technical and training support to assist them in teaching-learning process when they face constraints whereas for competent teachers, they are eager to share their expertise and provide technology support to their colleagues. Thus, lack of technical knowledge of maintaining the functionality of computers confused teachers to integrate ICT in the classroom. Numerous

problems related to ICT infusion occur among the teachers due to the lack of technical knowledge of maintaining the functionality of the computers.

Moreover, lack of technical support hinders the implementation of the computer programme. In the investigation of the three-year computer initiative, Priscilla et al (2008) found that educators were often confused by technical features of using computers for the teaching-learning process. The study reported that problems such as the breakdown of ICT devices and not having enough quick support led to insufficient class time. Teachers, who do not have quick support or lack technical knowledge, encounter problems and frustrations concerning the technical management of ICT tools. It was thus hypothesized that ICT support has great impact on teachers' use of technology as it can help boost the use of computers among educators in institutions of higher learning and this in turn can increase the likelihood of ICT integration in the teaching-learning interaction. Teachers often need technical assistance as well as pedagogical support such as advice on choosing relevant software and integrating it into a lesson plan. Teachers also need recommendations for ways how ICT can be used to meet educational objectives, along with ideas on how to organize a classroom to take full advantage of only a few computers. This could be due to the complexity and incompatability of the innovation and thus, negatively affecting ICT implementation in institutions of higher learning in Kabale District.

Lack of training support by administrators could be identified as a significant barrier towards implementation of computers in classrooms. Krysa (1998) reported that successful implementation of computers can only occur if administrators offer teachers support and leadership. In addition to administrators developing a philosophy to guide the implementation of

computer technology, they can support the technological professional development of teachers by: establishing flexible schedules so that teachers can practice what they have learned (or to continue their learning); encouraging and facilitating team teaching and peer coaching allowing teachers to visit each other's classrooms to observe computer technology integration; and scheduling regular meetings among teachers using technology to plan and evaluate instruction. Hsin-Kai et al (2007) in a study, teachers' beliefs about using educational technology in the science classroom in Taiwan found that although many teachers share beliefs that educational technology could promote learning and that the use of technology is desirable, they are reluctant to use computers (ICT) because of insufficient support and resources provided by schools.

Yang (2008), in a case study at Curtin University of technology reported that university teachers who received support from administrators had a high commitment to the adoption of ICT for teaching and learning. Data in the study suggested that the adoption of ICT in teaching and learning would be promoted by greater support of the change at the management level of the University. A crucial factor contributing to the promotion of the innovation is the availability of infrastructure resources: hardware, in terms of the number of computers in the school available for students and teachers for educational purposes, and the quality and functioning of equipment (speed of processors, peripherals and access to the internet) as well as available software. However, availability of ICT alone is insufficient and must be accompanied by technical as well as pedagogical support (Nachmis et al, 2004). Aryatuha (2007) also noted that the availability of computer hardware and software should be accompanied with training of the users and constant technical support. Without this, even though high quality hardware and software are available, they could be wasted or remain underutilized by the users. This could suggest the minimal ICT

implementation reported in institutions of higher learning in Kabale District and thus, the need for this study to investigate the extent to which administrative support influenced ICT implementation in Kabale District.

Mbulankende (2007) in his study, assessment of teacher training in ICT in selected universities in Uganda, reported that ICT like most innovations will not work without administrative support. The study suggested that continuous training should provide the support from which teachers can continue to keep and update with ICT and its application to subject pedagogy, in order to enhance their teaching skills. In all faculties, lecturers should be introduced and trained on how to use various ICT tools common in the classroom such as projectors, computers, electronic white boards, digital cameras and trouble shoot minor problems common with these facilities. The Ministry of Education and Sports should put in place appropriate strategies to ensure that integration of ICTs in teaching and learning process goes together with the recruitment, training and retention of staff. Peansupap and Walker (2005) indicated that the failure of ICT change derives from the traditional beliefs of managers and ICT experts that technology is a magic bullet and so neglect role of people in any change management task. However, solving technical issues can minimise users' resistance to technological innovation and thus, ICT implementation success is often realised by managers who understand the management of technological change. Thus, if teachers perceive ICT as a beneficial tool, compatible with their current activities, easy to use and have observable outcomes, they could demonstrate positive attitude towards ICT. This can positively influence ICT Implementation in institutions of higher learning.

Munyantware (2006) in his study, problems affecting teachers 'adoption of technology in classrooms among science and mathematics teachers in Kisoro District, reported that in addition to social support from colleagues, perceived support from the school influences teachers adoption decision. The study suggested that continuous support to teachers gives them confidence in using computers in teaching their relevant courses in institutions of higher learning in Kabale District. Akankwasa (2006) found out that although many teachers share beliefs that educational technology could promote learning and that the use of ICT is desirable, they are reluctant to use educational ICT because of insufficient support and resources. Much as the above mentioned studies were on the context of problems that influence ICT implementation, none of the problems studied were in line with cost of ICT training materials and administrative support the gap this study intended to close. The only factor that was similar was skills development in ICT. In addition, such studies did not even investigate problems influencing ICT implementation in institutions of higher learning in Kabale District, the gap this study intended to close.

Much as most of the above studies showed a positive relationship between administrative support and ICT implementation, none was on the context of selected institutions of higher learning in Kabale District. Hence the need for this study to investigate the extent to which administrative support influenced ICT implementation in selected institutions of higher learning in Kabale District.

2.2.4 Summary of literature review

As observed from the related literature from various scholars and past researchers collected from secondary sources i.e. textbooks, magazines, internet and journals, it shows that to a large

extent ICT implementation in developing countries is still minimal in some institutions of higher learning with exception of Makerere University. As regards to cost of ICT training materials, most studies indicate that to a large extent, costs were very high and thus affecting ICT implementation in institutions of higher learning as supported by Makau (1986) for Kenya, and Mumatz (2005) in Tanzania. However, few scholars like Tusubira and Mulira (2004); Ensafi et al (2007) were taking another positive trend in the case of higher education. Other scholars were concerned with ICT implementation in primary and secondary schools i.e. Makau for Nigeria, Munyantware for Uganda, thus leaving a gap for institutions of higher learning which this study intended to close.

For the case of skills development in ICT and administrative support, most scholars and past studies suggested that to a large extent these two variables positively affected ICT implementation. For example, Farrell, Agaba and Mugisha for Makerere University, Kyambogo University, and Mbarara University, respectively. Few scholars like Mooij and Smeets (2001) in Holland were of the view that possessing ICT skills does not warrant use of computers in teaching. However, no study was in the context of Kabale District the gap this study intended to close. As a researcher, there was thus a need for primary data to be collected to confirm the findings.

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

This chapter focuses on the design, population, sampling strategies, data collection methods and instruments, data quality control, procedure and data analysis to be used in the study.

3.1 DESIGN

The study used both quantitative and qualitative approaches. The quantitative approach was based on variables measured with numbers and analysed with statistical procedures (Creswell, 2003; Amin, 2005). In particular the study was a co-relational, cross-sectional survey research design. It was co-relational in that it was interested in relating each of the three problems to ICT implementation (Amin, 2005). The study used a survey in that it involved a large number of respondents and cross-sectional in so far as pertinent data was collected from all respondents once and for all to reduce on time and costs involved (Amin, 2005). The study took qualitative approach to provide a more realistic feel of the world of findings which cannot be quantified by using interviewing and observation.

3.2 POPULATION

The target population in the study constituted 90 teaching staff from the four institutions, 30 administrative staff and 200 undergraduate final year students and 300 diploma final year students. All the categories were involved because these are the group that dealt with ICT tools in their areas of operation and studies

3.3 SAMPLING STRATEGIES

In order to ensure representative of the samples, randomization was a suitable approach. To attain the respective sample sizes from the said four populations, the researcher used two sampling strategies, i.e. stratified-cum-cluster (Margaret, 1995) whereby in the first place, faculties and departments in the two universities and two colleges in the study were stratified into two: Sciences and Vocational which were most inclined to ICT; then humanities (e.g. Social Sciences and Arts) which were least inclined to ICT. Then in the second place each University and College in a given stratum constituted a cluster, which was presumably to be homogeneous as far as handling ICT is concerned. Then the two clusters were randomly selected from the respective strata. Cluster sampling dictated the selected member in a cluster as a respondent (Amin, 2005: Bakkabulindi, 2008). Stratification uses knowledge of the population to increase the representatives of a sample of a given size or to get an equivalent amount of information for a small sample (Margaret, 1995).

3.3.1 Sample size

Of the target population of 90 teaching staff, 30 administrative staff, and 500 final year students (undergraduate and diploma), Krejce and Morgan (1971)'s Table of Sample Size Determination, suggested minimum sample sizes of 73, 28, and 217 respectively (Appendix A).

Table 3.1: Sample size of the respondents

Category	**Population**	**Sample**
Lecturers	90	73
Students	500	217
Administrative staff	30	28
Total	620	318

Source: Records from academic registrars' offices of the four institutions.

3.4 DATA COLLECTION METHODS

This study used both secondary and primary data collection methods as described below:

3.4.1 Secondary data collection methods

The study obtained data from different secondary sources such as textbooks, magazines, journals, internet, and dissertations on the issue at hand at affordable cost.

3.4.2 Primary data collection methods

Due to normal short comings of secondary sources such as outdatedness and inadequacy in terms of coverage, the study went beyond secondary sources and contacted respondents for reliable data using self administered questionnaires (SAQs).This approach enabled the researcher to cover a large population quickly and at affordable cost; further SAQs were very suitable for the target respondents on account of their knowledge in English (Saunders et al, 2003). Structured interviews were applied to administrators since they were few, and were able to give in-depth information which could be left in SAQs. Observation and documentary review methods were used to obtain additional and vital information which could not be accessed through SAQs and interview.

3.5 DATA COLLECTION INSTRUMENTS

The study was guided by self administered questionnaires, interview guide, an observation check list and a documentary review guide as described below:

3.5.1 Self Administered Questionnaires

There were three sets of SAQs directed towards teaching staff; third year undergraduate students and second year diploma students. Each of the respective SAQs started with a main title; followed by introductory note about the research as shown in Appendix B and C. Most questions in the instrument were close-ended, and few were open ended questions to allow respondents freely express their opinions. The close-ended questions with predetermined multiple responses measured against a likert scale were used to collect quantitative data (Creswell, 2003). The study used this instrument because it helps cover a large number of respondents in a relatively short time, it is easy to guarantee the respondents' confidentiality and can generate reliable data as respondents could answer questions in their own mood without being affected by the researcher's presence (Mbaga, 1990).

3.5.2 Interview guide

For administrators, an interview guide was used to collect data from them, and questions were limited to cost of ICT training materials, skills development in ICT and administrative support (Appendix D).

3.5.3 Observation check list

An Observation check list was used to record observations as in a Yes/No option in order to establish observable items e.g. computers, whiteboards and softwares, activities in computer laboratories and lecture rooms. Through observation, additional and vital information which was left out in the questionnaire and interview was obtained (Appendix E). Such information included; state of computers in the computer laboratory, type of computer software used, number of working computers, training schedules and ICT policies in place.

3.5.4 Documentary review guide

A Documentary review guide was used to view and analyse the existing documents that would show evidence on ICT training so far conducted, the budgets, number of participants, evaluation reports, and ICT policies in place in the selected institutions (Appendix H).

3.6 DATA QUALITY CONTROL

Validity and reliability of the research instrument was ensured as follows:

3.6.1 Validity

Validity of instrument means that the instruments are serving the purpose for which they are intended (Keeves, 1988; Sarantokos, 1997). This is the ability to produce findings that are in agreement with theoretical or conceptual values or to produce accurate results and to measure what is supposed to be measured. The researcher ensured content validity of the SAQs by ensuring that questions in it conformed to the study's research objectives and conceptual framework (Fig. 2.1). Research experts and two research supervisors teaching at the East African Institute of Higher Education Studies and Development, School of Education, Makerere University, evaluated the relevance, wording and clarity of questions in the instrument. The research experts independently judged the validity of the items in the questionnaire, interview guide, observation guide and documentary review guide in relation to research objectives. The questionnaires were also field tested with a sample of 10 lecturers and 20 students from African College of Commerce, Kabale. These lecturers and students were not included in the final study. The Content Validity Index (CVI) was finally computed to determine the validity of the three sets of SAQs using the formula;

CVI = Total number of items rated as valid

Total number of items on the instrument

Twenty five questions out of thirty two were rated as relevant for lecturers, twenty three out of thirty one for students were rated as a valid and fifteen out of eighteen for administrators were rated relevant. The validity on the scale of training and ICT implementation was 0.78 for the lecturers, 0.74 for students and 0.83 for administrators, which were greater than the recommended 0.70 (Appendix G:111). Thus the instruments were considered valid (Golafmani, 2003; Beebwa, 2007).

3.6.2 Reliability

Reliability of the three set of SAQs on all variables (cost of ICT training materials, skill development in ICT and administrative support towards ICT implementation was tested using the Cronbach Alpha Moment Co-efficient provided by SPSS (Amin, 2005; Bakkabulindi, 2008).

Cronbach's Alpha is given as $\alpha = \frac{k}{k-1}\left(1-\frac{\sum SD^2 i}{SD^2 t}\right)$

Where:-

K = the number of items,

$\sum SD^2 i$ = the variance of the total instrument.

$SD^2 t$ = the variance of individual items

The calculated value of alpha for students was 0.704 while that for lecturers was found to be 0.837. As the acceptable reliability coefficient value of alpha is 0.70 (Beebwa, 2007), the instruments were considered reliable.

3.7 PROCEDURE

After establishing the validity and reliability of the instruments, an introductory letter was obtained from the Dean, School of Education, Makerere University which introduced the researcher to administrators in the selected area of study (Appendix H). The researcher approached all four heads of the institutions and was permitted to carry out research therein. To save time and reduce on transport costs, the researcher used the services of fellow lecturers as research assistants who distributed SAQs to lecturers and students. 200 questionnaires were distributed to students and 75 questionnaires were distributed to lecturers. The filled SAQs were collected from the research assistants after three weeks; thereafter items were edited, coded, and then entered into the computer for analysis. Out of 200 SAQs distributed to students, 173 (86%) were filled and returned where as 27 (14%) were not returned. Out of 75 SAQs distributed to lecturers, 60 (80%) were filled and returned while 15 (20%) were not returned. Interviews were conducted by the researcher with 20 selected administrators in the four institutions. Answers from interviewees were immediately filled in the spaces provided on the interview guide. With permission from heads of the four institutions, the researcher looked at the computer laboratories, lecture rooms and relevant documents. Observations were recorded on spot, coded, tallied, and then later analysed.

3.8 DATA PROCESSING AND ANALYSIS

The data collected from 253 respondents (i.e. 173 students, 60 lecturers and 20 administrators) was prepared or processed for analysis and then later actually analysed as described below.

3.8.1 Data processing

The collected data on SAQs was edited, categorised or coded and entered into the computer using the Statistical Package for Social Sciences (SPSS) for generation of summary frequency tables and graphics. Data collected with the interview guide was edited, categorised according to themes and then summarized into percentages in a computer spreadsheet. This was done by recording the data and organising it in themes. Thereafter the themes were analysed in line with the research questions that represented them. The number of responses was noted and the corresponding percentages computed. All data collected through the observation checklist and documentary review guide was coded, tallied, and the corresponding percentages determined. To protect the identity of the four selected institutions, codes KIA, KIB, KIC and KID were used, representing UCC-Kabale, NTC-Kabale, Bishop Barham University College, and Kabale University, respectively.

3.8.2 Data analysis

The data analysis at univariate level was based on relative frequencies derived from frequency tables and descriptive statistics. At bivariate level, ICT implementation was correlated with the respective training problems using Pearson's Linear Co-relation co-efficient, to help rate their significances in influencing ICT implementation in selected institutions of higher learning in Kabale District. T-test and ANOVA analysis were used to establish how ICT implementation varied with background variables. Using the Statistical Package for Social Sciences (SPSS) to test the relationship between the independent variables and dependent variable, Pearson's co-relation was considered appropriate to verify the hypotheses on the continuous variables. The researcher wanted to establish the degree and direction of relationship between training problems

and ICT implementation in selected institutions of higher learning in Kabale District. Data Collected from structured interviews and open ended questions was analysed and interpreted by means of percentages as a backup for quantitatively analysed data. Data collected through observation and documentary analysis was analysed and interpreted under their respective subject matter.

CHAPTER FOUR

RESULTS OF THE STUDY

4.0 INTRODUCTION

This chapter presents results of the study of which appendices B, C, D, E and F (pages: 103, 107, 111, 114, and 115, respectively) are the primary source. It gives the description of the background of respondents, the dependent variable (DV) and verification of hypotheses. The findings are presented, analysed and interpreted as per the set hypotheses in this study.

4.1 Background information

This section describes the background of respondents, according to faculty, gender, age group and designation.

4.1.1 Respondents by faculty

Table 4.1 shows distribution of respondents according to faculty.

Table 4.1: Distribution of respondents (students and lecturers) by faculty

Faculty	Frequency	Percent
Vocational	64	27.5
Arts	65	27.9
Education	66	28.3
Science	38	16.3
Total	**233**	**100.0**

Results from Table 4.1 show that Education, Arts, and Vocational Faculties took almost the same portions, with each above 27% while the Science Faculty took the least portion with 38

(less than 17%), indicating that science courses have fewer of numbers in the selected institutions of higher learning in Kabale District.

4.1.2 Respondents by gender

Table 4.2 shows the distribution of respondents according to gender.

Table 4.2: Distribution of respondents by gender

Gender	Frequency	Percent
Male	156	61.7
Female	97	38.3
Total	**253**	**100.0**

Results from Table 4.2 show that male respondents took the largest portion with 156 (over 61%), indicating that females are very few in the selected institutions of higher learning in Kabale District.

4.1.3 Respondents by age

Table 4.3 shows distribution of respondents according to age:

Table 4.3: Distribution of respondents by age

Age group in years	Frequency	Percent	Cumulative Percent
20-30	145	57.3	57.3
31-40	66	26.1	83.4
41-50	29	11.5	94.9
51 and above	13	5.1	100.0
Total	**253**	**100.0**	

Results from Table 4.3 show that age group of 20-30 took the largest portion with 145 respondents (over 57%) while the least age group was of 51 and above with 13 (less than 6%).

As per the cumulative percentage, majority of the respondents (over 83%) were 40 years and below. This indicates that there were few old staff in selected institutions of higher learning in Kabale District

4.1.4 Distribution of lecturers according to designation

Table 4.4: Distribution of lecturers as academic staff by designation

Designation	Frequency	Percent	Cumulative Percent
Assistant Lecturer	9	15.0	15.0
Lecturer	38	63.3	78.3
Senior Lecturer	7	11.7	90.0
Principal Lecturer	3	5.0	95.0
Professor	3	5.0	100.0
Total	**60**	**100.0**	

Results from Table 4.4 show that the "professor, principal lecturer and senior lecturer" categories took the least portion, with less than 22% while "lecturer" category took the largest portion with 38 (over 78%). This indicates that there were few senior teaching staff in the selected institutions of higher learning in Kabale District.

4.1.4 Distribution of administrators by designation

Table 4.5 shows distribution of administrators according to designation.

Table 4.5: Distribution of administrators by designation

Title	Frequency	Percent
Heads of Department	7	40.0
Academic Registrar	3	15.0
Deputy Academic Registrar	3	15.0
Principal	3	10.0
Deputy Principal	2	10.0
Vice Chancellor	1	5.0
Deputy Vice Chancellor	1	5.0
Total	**20**	**100.0**

Results from Table 4.5 show that the "heads of department" category took the largest portion of the interviewees, with over 40% while the "vice and deputy vice chancellor" categories took the least portion of 5% each. This indicates that there were few chancellors in selected institutions of higher learning in Kabale District.

4.2 Description of the Dependent Variable (DV)

This section describes the dependent variable (ICT implementation) conceptualized as; computer hardware and peripherals, computer software and communication facilities (internet). Section C of the questionnaire describes the dependent variable using 13 questions (Appendix B and C). Rating was done according to the Likert scale ranging from one to represent very rarely up to four to represent very regularly (Creswell, 2003). Table 4.6 shows lecturers' responses and descriptive statistics on ICT implementation in the selected institutions of higher learning in Kabale District.

Table 4.6: lecturers' responses and Descriptive statistics on ICT implementation (N=60)

Computer Hardwares	Response	Frequency	Percent	Mean	Standard deviation
Use of desk top computers	Very Rarely	6	10.0	3.02	.965
	Rarely	9	15.0		
	Regularly	23	38.3		
	Very Regularly	22	36.7		
Use of projectors	Very Rarely	33	55.0	1.63	.843
	Rarely	19	31.7		
	Regularly	5	8.3		
	Very Regularly	3	5.0		
Use of printers	Very Rarely	6	10.0	2.68	.911
	Rarely	19	31.7		
	Regularly	23	38.7		
	Very	12	20.0		

	Regularly				
Use of scanners	Very Rarely	39	65.0	1.57	.871
	Rarely	10	16.7		
	Regularly	9	15.0		
	Very Regularly	2	3.3		
Use of white boards	Very Rarely	42	59.7	1.48	.813
	Rarely	8	21.5		
	Regularly	9	15.0		
	Very Regularly	1	1.7		
Computer Software					
Use of word processors	Very Rarely	3	5.0	3.42	.829
	Rarely	4	6.7		
	Regularly	18	30.0		
	Very Regularly	35	58.3		
Use of spread sheets	Very Rarely	7	11.7	2.97	1.057
	Rarely	13	21.7		
	Regularly	15	25.0		
	Very Regularly	25	41.7		
Use of database management	Very Rarely	21	35.0	2.17	1.092
	Rarely	18	30.0		
	Regularly	11	18.3		
	Very Regularly	10	16.7		
Use of power point	Very Rarely	12	20.0	2.48	1.033
	Rarely	19	31.7		
	Regularly	17	28.3		
	Very Regularly	12	20.0		
Use of accounting software	Very Rarely	42	70.0	1.52	.930
	Rarely	10	16.7		
	Regularly	3	5.0		
	Very Regularly	5	8.3		
Communication and Internet					
Use of e-mail	Very Rarely	4	6.7	3.17	.847
	Rarely	5	8.3		
	Regularly	28	46.7		
	Very Regularly	23	38.3		

Use of electronic Learning	Very Rarely	33	55.0	1.58	.720
	Rarely	19	31.7		
	Regularly	8	13.3		
	Very Regularly	-	-		
Use of electronic journals	Very Rarely	45	75.0	1.33	.629
	Rarely	10	16.7		
	Regularly	5	8.3		
	Very Regularly	-	-		

From Table 4.6, results indicate that use of desk top computers scored the highest mean of 3.02 where as the use of projectors, scanners and white boards had their means tending to average two. This indicates that computer hardwares and peripherals were rarely used in teaching in selected institutions of high learning in Kabale District. Results from Table 4.6 also indicate that word processors and spreadsheets were the most frequently used softwares in teaching in the selected institutions of higher learning in Kabale District.

Results from Table 4.6 further indicate that use of e-mail scored the highest mean of 3.17 while the use electronic journal scored the least mean of 1.33. This indicates that electronic learning and electronic journal were not used in teaching in the selected institutions of higher learning in Kabale District.

Table 4.7 shows lecturers' responses and descriptive statistics on ICT implementation in the selected institutions of higher learning in Kabale District

Table 4.7: Students' responses and Descriptive statistics on ICT implementation (N=173)

Computer Hardware	Response	Frequency	Percent	Mean	Standard deviation
Use of desk top computers	Very Rarely	38	22.0	2.32	.921
	Rarely	57	32.9		
	Regularly	62	35.8		
	Very Regularly	16	9.2		
Use of projectors	Very Rarely	91	52.6	1.62	.757
	Rarely	59	34.1		
	Regularly	20	11.6		
	Very Regularly	3	1.7		
Use of printers	Very Rarely	50	28.8	2.17	.915
	Rarely	54	31.2		
	Regularly	59	34.1		
	Very Regularly	10	5.8		
Use of scanners	Very Rarely	90	52.0	1.65	.761
	Rarely	55	27.9		
	Regularly	27	15.6		
	Very Regularly	1	.6		
Use of white boards	Very Rarely	97	56.1	1.71	.951
	Rarely	42	24.3		
	Regularly	21	12.1		
	Very Regularly	13	7.5		
Computer Software					
Use of word processors	Very Rarely	11	6.4	3.13	.853
	Rarely	20	11.6		
	Regularly	78	45.1		
	Very Regularly	64	37.0		
Use of spread sheets	Very Rarely	23	13.3	2.72	.931
	Rarely	37	21.4		
	Regularly	79	45.7		
	Very Regularly	34	19.7		
Use of database management	Very Rarely	41	23.7	2.38	*.985*
	Rarely	47	27.2		
	Regularly	63	36.4		
	Very Regularly	22	12.7		
Use of power point	Very Rarely	52	30.1	2.18	.977
	Rarely	54	31.2		
	Regularly	50	28.9		
	Very Regularly	17	9.8		
Use of accounting software	Very Rarely	72	41.6	1.81	.838
	Rarely	70	40.5		
	Regularly	23	13.3		

	Very Regularly	8	4.6		
Communication and Internet					
Use of e-mail	Very Rarely	36	20.8	2.51	1.009
	Rarely	42	24.3		
	Regularly	65	37.6		
	Very Regularly	30	17.3		
Use of electronic Learning	Very Rarely	85	49.1	1.62	.677
	Rarely	69	39.9		
	Regularly	19	17.3		
	Very Regularly	-	-		
Use of electronic journals	Very Rarely	116	67.1	1.39	.607
	Rarely	46	26.6		
	Regularly	16	6.4		
	Very Regularly	-	-		

Results from Table 4.7 indicate that use of desk top computers scored the highest mean of 2.32 where as the use projectors, printers, scanners and white boards had their means also tending to average two. This indicates that computer hardwares and peripherals were rarely used in teaching in the selected institutions of high learning in Kabale District. Table 4.7 also illustrates that use of word processors scored the highest mean of 3.13 while the use of accounting software scored the least mean of 1.81. This indicates that word processors and spreadsheets were the most frequently used softwares in teaching in the selected institutions of higher learning in Kabale District.

Table 4.7 further shows that use of e-mail scored the highest mean of 2.51 while the use electronic journal scored the least mean of 1.39. This indicates that electronic learning and electronic journal were rarely used in teaching in the selected institutions of higher learning in Kabale District.

For purposes of obtaining an overall picture of how lecturers and students as respondents rated ICT implementation, items in Table 4.6 and Table 4.7 for the dependent variable (ICT implementation) were aggregated into one average index (AvICTimp). Fig 4.1 illustrates ICT implementation using a histogram.

Fig. 4.1: Histogram showing normal curve for ICT implementation

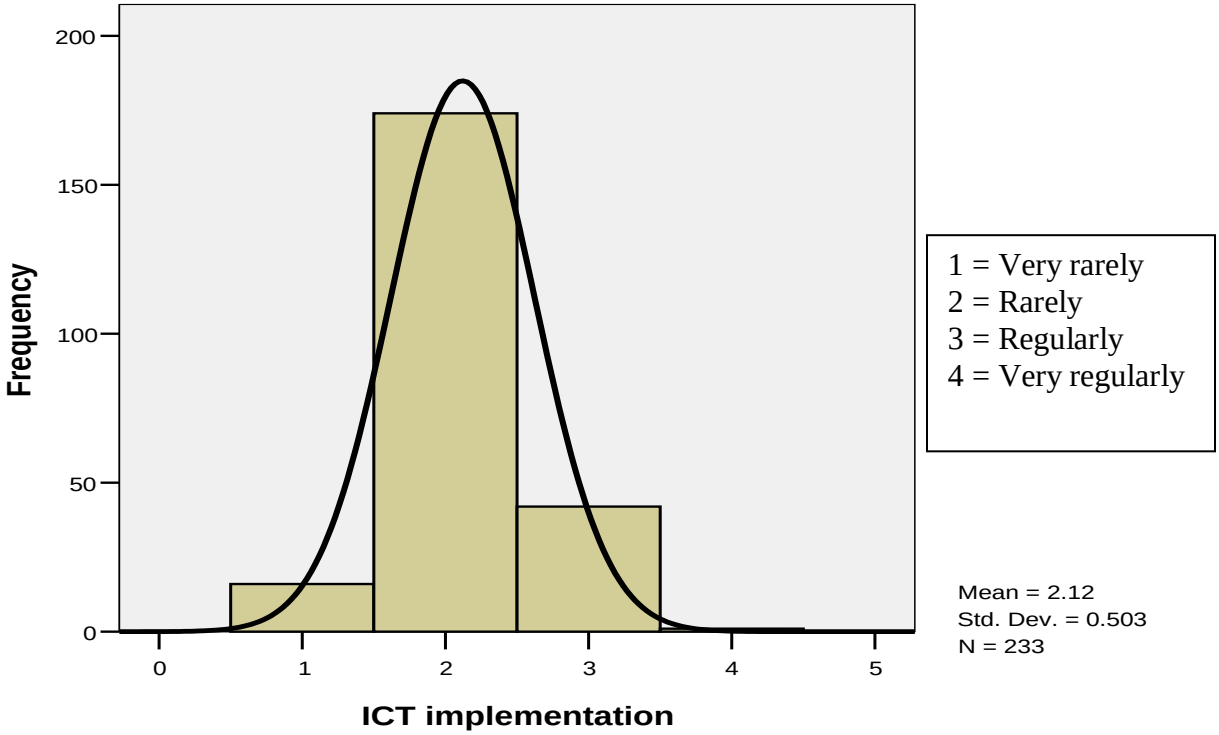


Fig.4.1 shows that respondents' (lecturers and students) rating on ICT implementation mainly concentrated on level two indicating that the "rarely" category took the largest portion while the " very regularly" category (four) took the least portion. Fig. 4.1 further indicates that generally responses to the thirteen set questions about the dependent variable (ICT implementation) were tending towards "rarely" as indicated by the overall mean score of 2.12. This indicates that ICT implementation was minimal in selected institutions of higher learning in Kabale District.

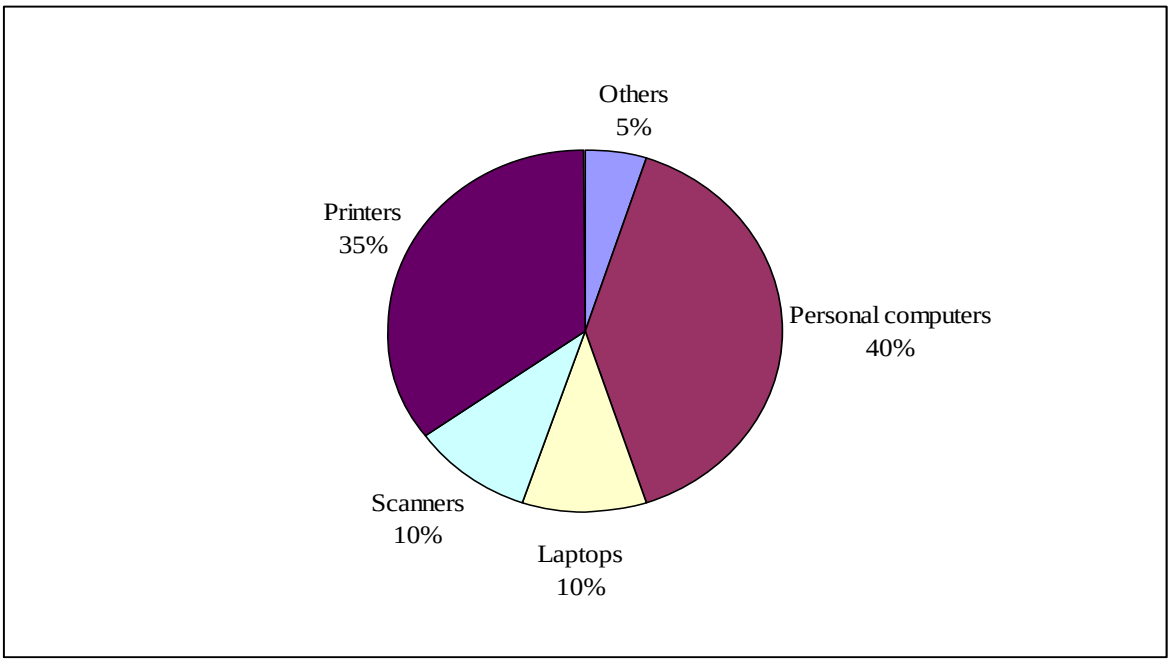
However, as per interview with administrators, majority of interviewees confirmed that not all lecturers used computers in teaching. Out of the 20 administrators interviewed, results show that 18 (90%) was of the "No**"** category implying that lecturers did not use computers in teaching, whereas only 2 (10%) indicated "Yes**"** showing that lecturers used computers in teaching. Findings in this study indicate that few of the lecturers were able to use computers in teaching while majority of the lecturers were still comfortable with their traditional ways of teaching by using local blackboard and dictating notes. In addition computers were not many for every lecturer to access and use them in preparing their lessons. This shows that administrators perceived that much as ICT training was emphasized, most lecturers were unable to use computers in teaching.

Administrators were asked to mention what computer hardwares lecturers normally use in teaching. The responses from administrators were categorized into five main themes i.e. desk top computers, laptops, projectors, scanners, printers and others (digital camera, electronic whiteboards, video conferencing facilities, etc). All the administrators interviewed confirmed that in most cases some of the lecturers used desk top computers in teaching, others used printed and photocopied notes and few used scanners and projectors especially during workshops and seminars. Findings in this study indicate that most of the lecturers in the four sampled institutions did not have access to computers at their convenient time and thus they could compete with students in the computer laboratories to use computers. The few lecturers who used computers were further confronted with lack of skills of trouble shooting in case of technical problems. This shows that lecturers were not facilitated in acquiring computers for official use and thus unable to employ computers in teaching. Nevertheless, their keenness in ICT knowledge advancement

motivated such individuals in this category to acquire their own desk top computers or Laptops for their personal use.

Fig. 4.2 shows distribution of computer hardwares lecturers normally use in teaching as perceived by administrators.

Fig. 4.2: Administrators' rating on computer hardwares lecturers normally use



However, through observation, results show that most of the lecturers that were observed in lecture rooms were mainly using the chalkboard and textbooks in giving notes and explanations to students. Apart from the five computer laboratories in the four sampled institutions, none of the lecture rooms had a desk top computer and an over head projector. Furthermore, the number of computers in the computer laboratories were very few, in the four institutions sampled, desk

top computers ranged from 20 to 70 in number. Worse still, in two of the four institutions sampled, at least four students were observed sharing one computer in the computer laboratory for academic work. According to the time tables observed by the researcher in all the four institutions for ICT related courses, computer training was done in shifts since computers were very few. This indicates that computer teaching mainly concentrated on ICT related courses, thus leaving other courses to be taught using traditional methods.

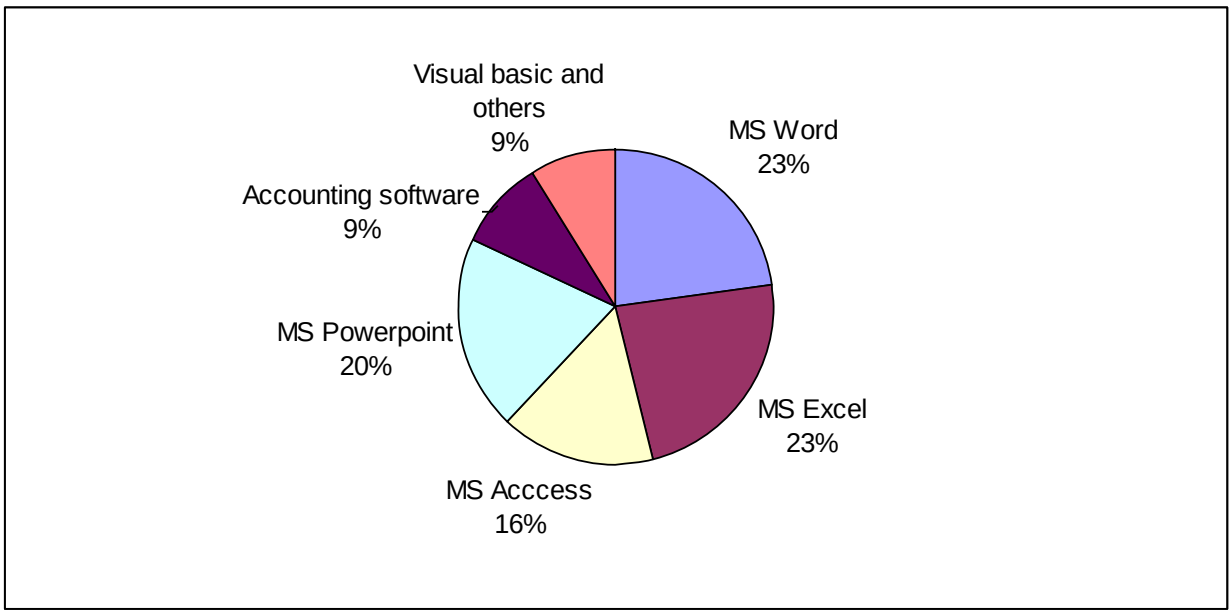
Table 4.8: Illustration on the availability of computer hardwares

Institution Code	No. of Comp labs	No. of computers in labs	Overhead projector	No. of computers in lecture rooms	Electronic white boards
KIA	1	32	0	0	0
KIB	2	40	0	0	0
KIC	1	60	0	0	0
KID	1	72	0	0	0

Respondents (students and lecturers) were asked to list any other software that lecturers use in teaching. Out of the 233 respondents, results show that 148 (over 67%) did not list any other software apart from those that are given in Tables 4.6 and 4.7 while 65 (33%) of the respondents listed the following software which were recorded as: Microsoft publisher, page maker, visual basic, encyclopedia, SQL, SPSS, dreamer weaver, Microsoft project, sage, and Photoshop. From the interview guide, administrators were asked to answer what computer softwares lecturers normally use in teaching. The responses were categorized mainly under MS word, Ms excel, MS access, Accounting software, and Visual basic and others. Results show that, MS word and Ms excel packages were the most commonly used software in the selected institutions of higher learning in Kabale District, with over 23%. Accounting software, visual basic and others were the least used softwares with less than 10%. This could be attributed to the cost of acquiring such

specialized softwares being high. Fig 4.3 shows distribution of software commonly used in teaching as perceived by administrators.

Fig. 4.3: Administrators' rating on software commonly used in teaching



Respondents (Lecturers and students) were asked to specify any other internet facility they were familiar with. Results indicate that majority did not specify any other internet facility. Of the total respondents, 168 (over 72%) did not answer that part, leaving very few (less than 18%) listing such facilities they were familiar with as: website, e-commerce, teleconferencing, Google. However, three of the respondents commented that they could not specify something they had never seen. Some lecturers did not have even an e-mail address for sending and receiving messages, while those who had e-mail, were not using them for accessing and sending academic information. This indicates that most lecturers in the selected institutions of higher learning in Kabale District were not familiar with the available internet facilities even when computers were connected to the internet.

Administrators were asked to answer whether their institutions have any Local Area Network (LAN). Of the 20 administrators interviewed, results show that 16 (80%) confirmed that their institutions did not have any Local Area Network while only four (20%) agreed that their institutions had Local Area Network. Results show that institutions had Local Area Networks that were not accessible to lecturers and students. This indicates that some of the administrators were not aware of existence of LAN in their institutions even when it was there.

Administrators were also asked to answer whether their institutions have an internet in place. Of the 20 administrators interviewed, results show that 15 (75%) confirmed that their institutions had internet facility, while 5 (25%) said that they did not have an internet facility in their institutions. For example, one of the administrators commented thus, "*If I need the internet I go to an internet cafe in town*". Results were confirmed through observation where the researcher physically observed the availability of the internet. Out of the four institutions visited, three institutions were connected to the internet.

Administrators were also requested to answer how internet is used by both lecturers and students. Out of the 15 administrators interviewed, results show that 10 (67%) confirmed that internet was mainly for reading news, receiving and sending mails, while 5 (33%) indicated that internet was mainly used for academic and research purposes, i.e. searching for new information. This indicates that majority of lecturers did not have interest of using internet for teaching purposes in the selected institutions of higher learning in Kabale District.

4.3 Background variables and ICT implementation

This section shows how the dependent variable (ICT implementation) varied with the common background variables in the questionnaire. These variables include; faculties, gender, designation and title.

4.3.1 Variation of ICT implementation by faculty

The interest here was to investigate whether ICT implementation varied with faculties. Table 4.9 shows the descriptive statistics and ANOVA results on how ICT implementation varied by faculties in all the four selected institutions of higher learning in Kabale District.

Table 4.9: Descriptive statistics and ANOVA results for ICT implementation by faculty

Faculty	Frequency	Mean	Standard deviation	df	F	Sig.
Vocational	64	2.13	.519	3	2.967	.033
Arts	65	2.11	.359			
Education	66	2.02	.540			
Science	38	2.32	.574			

By comparing means in ICT implementation for the four faculties, Table 4.9 shows that science faculty had the highest mean of 2.32 while education had the least arithmetic mean of 2.02. According to the computed F value of 2.967, the difference is statistically significant since Sign. Value of 0.033 is less than $\alpha = 0.05$. Thus, means in ICT implementation for the four faculties differed significantly.

4.3.2 Variation of ICT implementation by gender

The study was interested in establishing whether ICT implementation varied with gender. Table 4.10 shows summary statistics and T-test results on how ICT implementation varied with gender of students and lecturers in the selected institutions of higher learning in Kabale District.

Table 4.10: Summary statistics and T-test results for ICT implementation by gender

Gender	Frequency	Mean	Std. Deviation	df	t	Sig. (2-tailed
Male	141	2.09	.485	232	-1.320	.188
Female	92	2.17	.526			

By comparing means in ICT implementation for the two sexes, Table 4.11 shows that female respondents had the highest mean of 2.17 which was not far different from 2.09 for male respondents. According to the computed t value of -1.320, the difference is statistically insignificant since the significance value of 0.188 is greater than $\alpha = 0.05$. Thus, means in ICT implementation for the two sexes did not differ significantly.

4.3.4 Variation of ICT implementation by designation

The study was interested in finding out whether ICT implementation varied with designation among academic staff. Table 4.11 shows descriptive statistics and ANOVA results on how ICT implementation varied by designation.

Table 4.11: Summary statistics and ANOVA results for ICT implementation by designation

Designation	Frequency	Mean	Std. Deviation	df	F	Sig.
Assistant Lecturer	9	2.44	.527	4	1.134	.350
Lecturer	38	2.13	.704			
Senior Lecturer	7	2.29	.488			
Principal Lecturer	3	2.67	.577			
Professor	3	2.67	.577			

By comparing means in ICT implementation of the seven categories of designation among academic staff, Table 4.11 shows that professors and principal lecturers had the highest mean of 2.67 each which was far different from the least mean for lecturers of 2.13. However, according to the computed F value of 1.134, the difference is statistically insignificant since the significance value of 0.350 is greater than $\alpha = 0.05$. Thus, means in ICT implementation for the five designations did not differ significantly.

4.4 Verification of hypotheses

This section deals with the verification of the three study hypotheses.

4.4.1 Hypothesis One ($H0_1$): Cost of ICT training materials does not enhance ICT implementation in the selected institutions of higher learning in Kabale District

Under this section using purchase price, installation cost and maintenance fee as concepts for cost of ICT training materials, lecturers and students as respondents were asked to rate how costly they find cost of ICT training materials in respect to computers (Appendix B and C). Rating was done according to the Likert scale ranging from one to represent strongly disagree up to five to represent strongly agree (Creswell, 2003). Descriptive statistics on lecturers' rating of cost of ICT training materials are given in Table 4.12

Table 4.12: Descriptive statistics on lecturers' rating on cost of ICT training materials. (N=60)

Variable	Response	Frequency	Percent	Mean	Std. deviation
Purchase price is high	Strongly Disagree	1	1.7	3.67	1.145
	Disagree	15	25.0		
	Not Sure	1	1.7		

	Agree	29	48.3		
	Strongly Agree	14	23.3		
Installation cost is high	Strongly Disagree	2	3.3	3.78	.885
	Disagree	3	5.0		
	Not Sure	10	16.7		
	Agree	36	60.0		
	Strongly Agree	9	15.0		
Maintenance fee is high	Strongly Disagree	2	3.3	3.92	.979
	Disagree	4	6.7		
	Not Sure	7	11.7		
	Agree	31	51.7		
	Strongly Agree	16	26.7		

Findings in Table 4.12 illustrate that lecturers perceived that the cost of ICT materials as mainly high in the selected institutions of higher learning in Kabale District. Table 4.12 further indicates that lecturers as respondents rated maintenance fee as high with mean of 3.92.

Table 4.13: Descriptive statistics on students' rating on cost of ICT training materials.

(N=173)

Variable	**Response**	**Frequency**	**Percent**	**Mean**	**Std. deviation**
Purchase price is high	Strongly Disagree	18	10.4	3.27	1.248
	Disagree	36	20.8		
	Not Sure	28	16.2		
	Agree	64	37.0		
	Strongly Agree	27	15.6		
Installation cost is high	Strongly Disagree	8	4.6	3.40	1.135
	Disagree	41	23.7		
	Not Sure	22	12.7		
	Agree	77	44.5		
	Strongly Agree	25	14.5		
Maintenance fee is high	Strongly Disagree	8	4.6	3.49	1.124
	Disagree	31	17.9		
	Not Sure	34	19.7		
	Agree	68	39.3		
	Strongly Agree	32	18.5		

Results from Table 4.13 show that the "agree" category in relation to purchase price, installation cost and maintenance fee took the largest portion with over 50% of students. Findings from Table 4.13 illustrate that students perceived that the cost of ICT materials as mainly high in selected institutions of higher learning in Kabale District. This indicates that cost of ICT training materials was very high in selected institutions of higher learning in Kabale District.

For purposes of obtaining an overall picture of how lecturers and students as respondents rated cost of ICT training materials, items in Table 4.12 and 4.13 were aggregated into one average index (AvCost). Fig 4.4 illustrates cost of ICT training materials using a histogram.

Fig. 4.4: Histogram showing normal curve for cost of ICT training materials

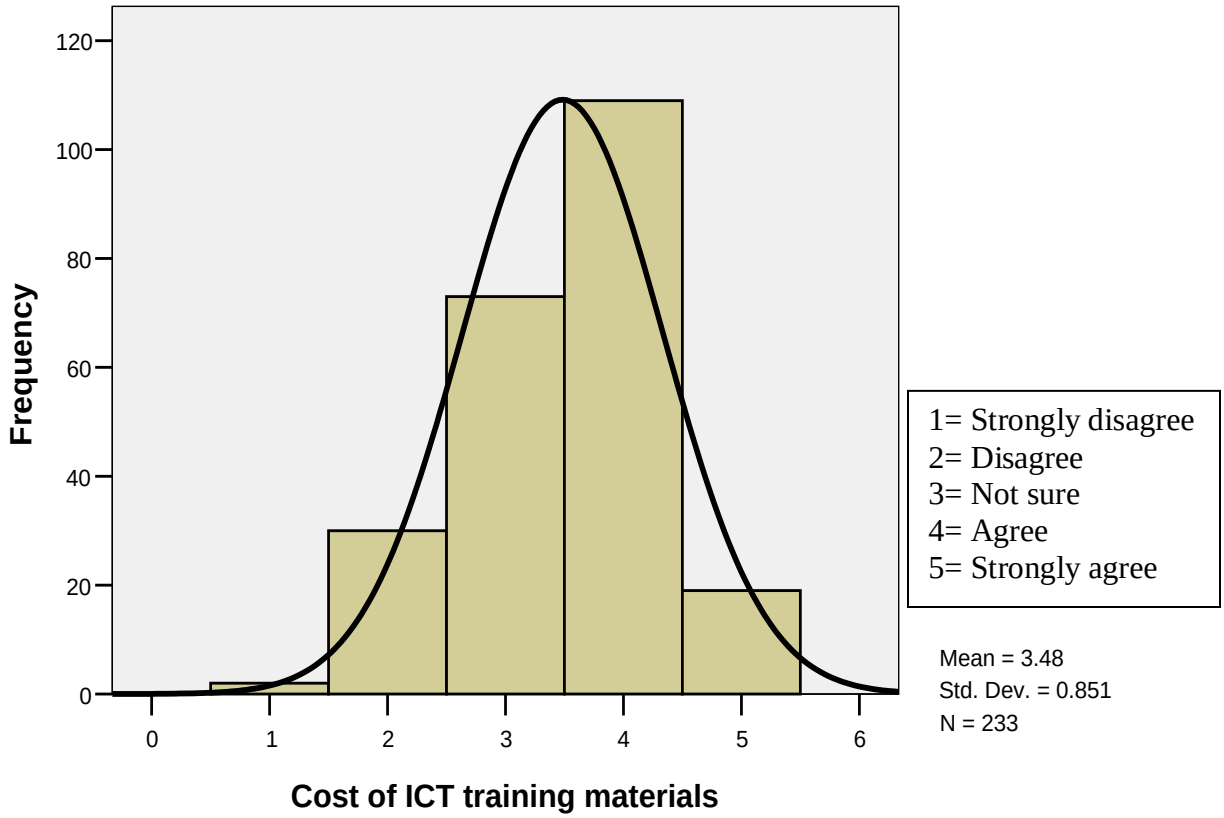


Fig.4.4 shows that rating of cost of ICT materials concentrated more on category four (agree) while category one (strongly disagree) took the least portion, implying that students and lecturers as respondents perceived cost of ICT training materials as mainly high in the selected institutions of higher learning in Kabale District.

Respondents were asked to comment on the cost of ICT training materials. Opinions of respondents were categorized into three main themes (i.e. very expensive, moderate and relatively cheap). As per the opinion of all lecturers and students as respondents, findings indicate that the cost of ICT training materials was mainly very high. Out of the 233 respondents, results indicate that 170 (73%) confirmed that cost of ICT training materials was very high, 36 (15%) as neither high nor cheap (moderate) and 27 (12%) showed that cost of ICT training material was relatively low.

The administrators were asked the costs involved in ICT training materials. Results show that various costs were incurred by the selected institutions of higher learning in Kabale District towards cost of ICT training materials. These include purchase of hardwares and softwares, repairs of hardware, installation and connection charges, upgrading materials like RAM and software, internet subscriptions and licensing fees on software, hiring of IT professionals and ICT materials like projectors. Majority of the administrators interviewed in the four sampled institutions of higher learning in Kabale District, perceived cost of ICT training materials as very high. Results also indicate that out of the 20 administrators interviewed, 16 (80%) emphasized that cost of ICT training materials was mainly very high. For example one administrator commented thus, "*Our lecturers rarely use computers in teaching since the institution is still young and computers are not affordable".*

Furthermore, interviewees were requested to answer whether cost of ICT training materials was a barrier towards teaching using computers. Out of the 20 administrators interviewed, results show that 18 (90%) confirmed that cost of ICT training materials was a barrier to teaching using computers while only two (10%) showed that cost of ICT training material was not a barrier to teaching using computers. Findings indicate that interviewees perceived cost of ICT training materials as high and thus negatively affecting lecturers' use of computers in the selected institutions of higher learning in Kabale District.

According to observations by the researcher, results indicate that most institutions had internet facility. Furthermore, computers were very few and teaching was done in shifts in all the four institutions sampled. Lack of computers and access to computers were a hindrance for most lecturers to teach using computers. The researcher observed that on average of four students were sharing computers during computer lessons. For example, in one of the lessons observed, one of the lecturers who was teaching an accounting package (pastel) had 75 students with only 20 computers. Table 4.14 shows a summarized completed observation checklist on internet connections.

Table 4.14: Summarized completed observation checklist showing internet connections

Institution Name	No. of computers	Working computers	Computers not working	computers connected to internet	computers not connected
KIA	32	23	9	0	23
KIB	44	36	8	20	16
KIC	60	50	10	30	20
KID	72	60	12	40	20

Results obtained from observed documents from the four sampled institutions indicate that students contributed towards computer repairs and maintenance by paying computer fee. However, expenditure on repairs and maintenance were higher than what was collected from students. For example, out of the four institutions sampled, documents revealed that three (75%) were using ICT experts from Kampala to repair their computers and only one (25%) was using local technicians within Kabale. This indicates that experts from Kampala charge highly than local technicians and thus increasing the cost of computer maintenance. Much as students were paying technology fee for computer maintenance and repairs, the researcher established that there were still more computers which were not repaired and thus out of use by both students and lecturers. The researcher also observed that all the four institutions sampled were using old versions of operating system like windows 98, windows 2000 and trial versions of anti-guard virus softwares. This implies that computer maintenance costs were very high in the selected institutions of higher learning in Kabale District.

Observations from existing documents revealed that most institutions buy second hand and refurbished computers. For example, documents from one of the head of ICT Department in one of the four sampled institutions revealed a consignment of 11 new computers and one printer that were supplied by the Ministry of Education and Sports in 2003. In the other three institutions, documents revealed that most computers were bought from as second hand dealers. This implies that prices of new computers were very high for the institutions to afford and thus resorting to second hand ones which were not working properly. Using second hand computers by institutions was lamented as a major problem lecturers find in teaching using computers. Speed

of such second hand computers is low and computers are always on and off. Table 4.15 shows a summary status of computers in the four selected institutions of learning in Kabale District.

Table 4.15: Summary status of computers in selected institutions

Institution Code	Status of computers		Lecturer computer ratio	Student computer ratio
	New	Second hand		
KIA	10	30	5:1	40:1
KIB	5	39	10:1	45:1
KIC	5	50	15:1	35:1
KID	5	55	15:1	30:1

Results from Table 4.15 show that the cost of new computers is high such that the selected institutions of higher learning in Kabale District use more of second hand computers.

For purposes of testing hypothesis One, using the index for ICT implementation (AvICTimp) generated in section 4.2 relationship between the two indices (AvCost and AvICTimp) was developed using Pearson's Linear Co-relation co-efficient. Table 4.16 shows co-relation of cost of ICT training materials and ICT implementation

Table 4.16: Co-relation of cost of ICT training materials and ICT implementation

	Cost of ICT training materials	ICT implementation
Pearson Correlation	1	-.046
Sig. (2-tailed)		.484
N	233	233

** Correlation is significant at the 0.05 level (2-tailed).

Table 4.16 shows an insignificant relationship between cost of ICT training materials and ICT implementation, since significant value of 0.484 is greater than $\alpha = 0.05$. However, cost of ICT training materials has a negative relationship of -0.046 to ICT implementation. This implies that cost of ICT training materials negatively affected ICT implementation. Thus, the null hypothesis is accepted which states that cost of ICT training materials does not enhance ICT implementation in selected institutions of higher learning in Kabale District. Therefore, with high cost of ICT training materials ICT implementation becomes minimal.

4.4.2 Null Hypothesis Two ($H0_{2)}$: Skills development in ICT does not enhance ICT implementation in selected institutions of higher learning in Kabale District.

This section presents data on the rate at which skills in ICT are developed at different levels of lecturers and students' academic career using Ordinary level, Advanced level and Tertiary level as concepts. Lecturers and students were asked to rate skills development in ICT at various levels in academic career. Table 4.17 shows descriptive statistics on lecturers' rating of skills development in ICT.

Table 4.17: Descriptive statistics on lecturers' rating of skills development in ICT (N=60)

Variable	Response	Frequency	Percent	Mean	Std. deviation
Skills development in ICT at Ordinary level	Poor	33	55.0	1.60	.741
	Fair	18	30.0		
	Good	9	15.0		
	Very Good	-	-		
	Excellent	-	-		
Skills development in ICT at Advanced level	Poor	21	35.0	2.03	.920
	Fair	19	31.7		
	Good	17	28.3		

	Very Good	3	5.0		
	Excellent	-	-		
Skills development in ICT at Tertiary level	Poor	2	3.3	3.13	.929
	Fair	12	20.0		
	Good	26	43.3		
	Very Good	16	26.7		
	Excellent	4	6.7		

Findings from Table 4.17 indicate that lecturers' skills development in ICT was mainly poor at Ordinary level, poor at Advanced level and good at Tertiary level in the selected institutions of higher learning in Kabale District. Table 4.17 further illustrates that lecturers in this study rated high on skills development in ICT at Tertiary level with mean of 3.13. They equally rated slightly average on skills development in ICT at Advanced level with mean of 2.03 and rated low on skills development in ICT at Ordinary level with a mean of 1.60.

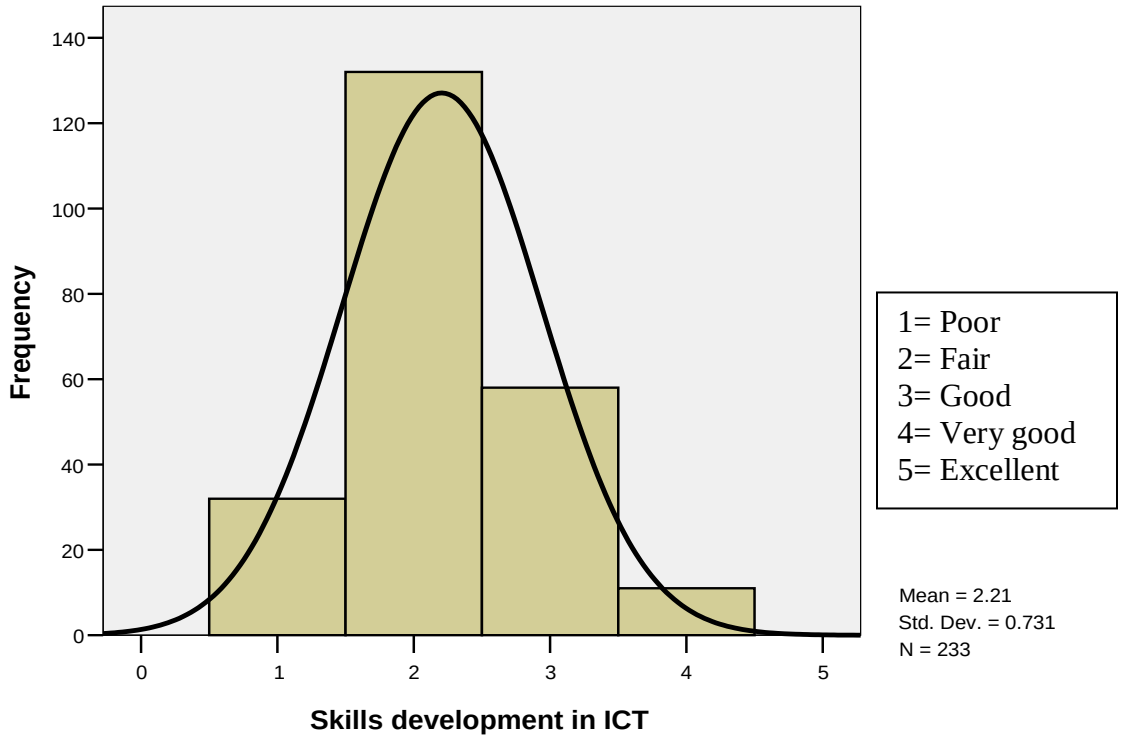
Table 4.18: Descriptive statistics on students' rating of skills development in ICT (N=173)

Variable	Response	Frequency	Percent	Mean	Std. deviation
Skills development in ICT at Ordinary level	Poor	105	60.7	1.52	.712
	Fair	46	26.6		
	Good	22	12.7		
	Very Good	-	-		
	Excellent	-	-		
Skills development in ICT at Advanced level	Poor	61	35.3	1.98	.888
	Fair	67	38.7		
	Good	36	20.8		
	Very Good	9	5.2		
	Excellent	-	-		
Skills development in ICT at Tertiary level	Poor	7	3.0	3.08	.927
	Fair	55	23.6		
	Good	98	42.1		
	Very Good	58	24.9		
	Excellent	15	6.4		

Findings from Table 4.18 indicate that students' skills development in ICT was mainly poor at Ordinary level, fair at Advanced level and good at Tertiary level in the selected institutions of higher learning in Kabale District. Table 4.18 further illustrates that students in this study rated high on skills development in ICT at Tertiary level with mean of 3.06. They equally rated slightly average on skills development in ICT at Advanced level with mean of 1.98 and rated low on skills development in ICT at Ordinary level with a mean of 1.52.

For purposes of obtaining an overall picture of how lecturers and students as respondents rated skills development in ICT, items in Table 4.17 and 4.18 were aggregated into one average index (AvSkils). Skills development in ICT is illustrated in Fig.4.5

Fig. 4.5: Histogram showing normal curve for skills development in ICT



According to Fig.4.5, results indicate that skills development in ICT mainly concentrated at level two, indicating that the "fair" category took the largest portion while the "excellent" category took the least portion.

Respondents were asked to give their opinion by commenting on how skills in ICT are acquired in their respective institutions. Opinions of respondents show that skills in ICT in selected institutions of higher learning in Kabale District were acquired under various ways. These were categorized under three major themes;

i. Informal training i.e. teaching oneself through trial and error, help from a friend/family member, and help from a co-worker.
ii. Semi-formal training i.e. Self-paced training provided by the person's employer or former employer, using videos, CD-ROMS, manuals, on line help, tutorials, on the job training and web based training.
iii. Formal training i.e. course paid for by self, employer sponsored course and taking course at an educational institution for which the person is registered.

Distribution of lecturers and students' opinion on how skills in ICT are acquired is given in Table 4.19

Table 4.19: Lecturers and students' opinion on how ICT skills are acquired

How are skills in ICT acquired in your institution?	FREQUENCY	PERCENTAGE
Informal training	33	14%
Semi formal training	51	22%
Formal training	149	64%
TOTAL	**233**	**100%**

Majority of respondents as shown in Table 4.19 perceived that skills in ICT are acquired mainly through formal training, with 149 (over 64%) and few through informal training representing 14%. This indicates that acquisition of skills in ICT in the selected institutions of higher learning in Kabale District is mainly by taking a course at an educational institution where a person is officially registered.

Administrators were requested to answer whether all lecturers have ICT skills. Out of the 20 administrators interviewed, results reveal that 15 (75%) confirmed that most lecturers did not have ICT skills while only 5 (25%) indicated that all lecturers had ICT skills. This indicates that most of the lecturers in the selected institutions of higher learning in Kabale District did not have ICT skills. Administrators were also requested to answer whether there was systems for helping lecturers identify their training needs. Out of the 20 administrators interviewed, results show that 12 (60%) confirmed that there was a system for helping lecturers identify their training needs whereas 8 (40%) indicated that lecturers had no system for helping them identify their training needs. This indicates that lecturers were mainly helped to identify their ICT training needs in selected institutions of higher learning in Kabale District.

Furthermore, administrators were asked to answer whether there was a programme relating to development of ICT use that incorporated subject specific issues. Out of the 20 administrators interviewed, results indicate that 4 (20%) confirmed that there was a programme relating to development of ICT use that incorporated subject specific issues while 16 (80%) disagreed. This shows that in most cases, programmes relating to ICT training in specific subject areas were not available in selected institutions of higher learning in Kabale District. For example, one of the

administrators interviewed from the four sampled institutions had this comment, "*Due to absence of Fidelio software for hotel and institutional catering, MS excel and MS access were adopted as alternatives*".

Review of existing documents revealed that none of the four institutions had a working ICT policy in place. For example, one of the four institutions sampled had an ICT circular as a policy from the Ministry of Education and Sports indicating that by 2007 all lecturers were supposed to have acquired have their own computers and be able to teach all courses using computers. However, what was on the ground was different as most lecturers that were seen teaching were not using computers. In the other three sampled institutions, documents on training were mainly adverts for ICT short courses for students and the general public.

For purposes of testing hypothesis two, using the average index for ICT implementation (AvICTimpl, Section 4.2), the relationship between two indices (AvSkills and AvICTimpl) was developed using Pearson's linear Co-relation Co-efficient. Table 4.20 shows correlations of skills development in ICT and ICT implementation:

Table 4.20: Pearson's Correlation of skills development in ICT and ICT implementation

	Skills development in ICT	**ICT implementation**
Pearson Correlation	1	.319(**)
Sig. (2-tailed)		.000
N	233	233

** Correlation is significant at the 0.05 level (2-tailed).

Results in Table 4.20 depict a significant relationship between skills development in ICT and ICT implementation, since sign. Value of 0.000 is less than $\alpha = 0.05$. Skills development in ICT has a positive relationship of 0.319 to ICT implementation. This implies that skills development in ICT positively affected ICT implementation. Thus, the null hypothesis is rejected which states that skills development in ICT does not enhance ICT implementation in selected institutions of higher learning in Kabale District. Therefore, alternative hypothesis is accepted which states that skills development in ICT enhances ICT implementation in institutions of higher learning in Kabale district.

4.4.3 Null Hypothesis Three ($H0_3$): Administrative support does not enhance ICT implementation in selected institutions of higher learning in Kabale District.

In this section using financial support, technical assistance, and managerial support as concepts for administrative support, respondents were asked to rate how administrators helped lecturers in ICT training in selected institutions of higher learning in Kabale District. The rating was done according to the Likert scale ranging from one to represent strongly disagree to five representing strongly agree (Creswell, 2003). Descriptive statistics on lecturers' rating of administrative support is given in Table 4.21

Table 4.21: Descriptive statistics on lecturers' rating of administrative support

Variable	Response	Frequency	Percent	Mean	Std.deviation
Financial support given to lecturers is enough	Strongly Disagree	17	28.3	2.63	1.275
	Disagree	12	20.0		
	Not Sure	7	11.7		
	Agree	24	40.0		
	Strongly Agree	-	-		
Technical support	Strongly Disagree	10	16.7	2.47	1.016
	Disagree	25	41.7		

given to lecturers is enough	Not Sure	12	20.0		
	Agree	13	21.7		
	Strongly Agree	-	-		
Managerial support given to lecturers is enough	Strongly Disagree	22	36.7	2.18	1.142
	Disagree	17	28.3		
	Not Sure	9	15.0		
	Agree	12	20.0		
	Strongly Agree	-	-		

As per Table 4.21 using frequency and percentage, results indicate that lecturers in this study professed that administrative support given to lecturers towards ICT training was mainly not enough. Results from Table 4.21 further show that lecturers rated financial support as high with a mean of 2.63, with the least being managerial support with a mean of 2.18. However, the three categories tended to the average rating of disagreeing since their arithmetic means were all below 2.8.

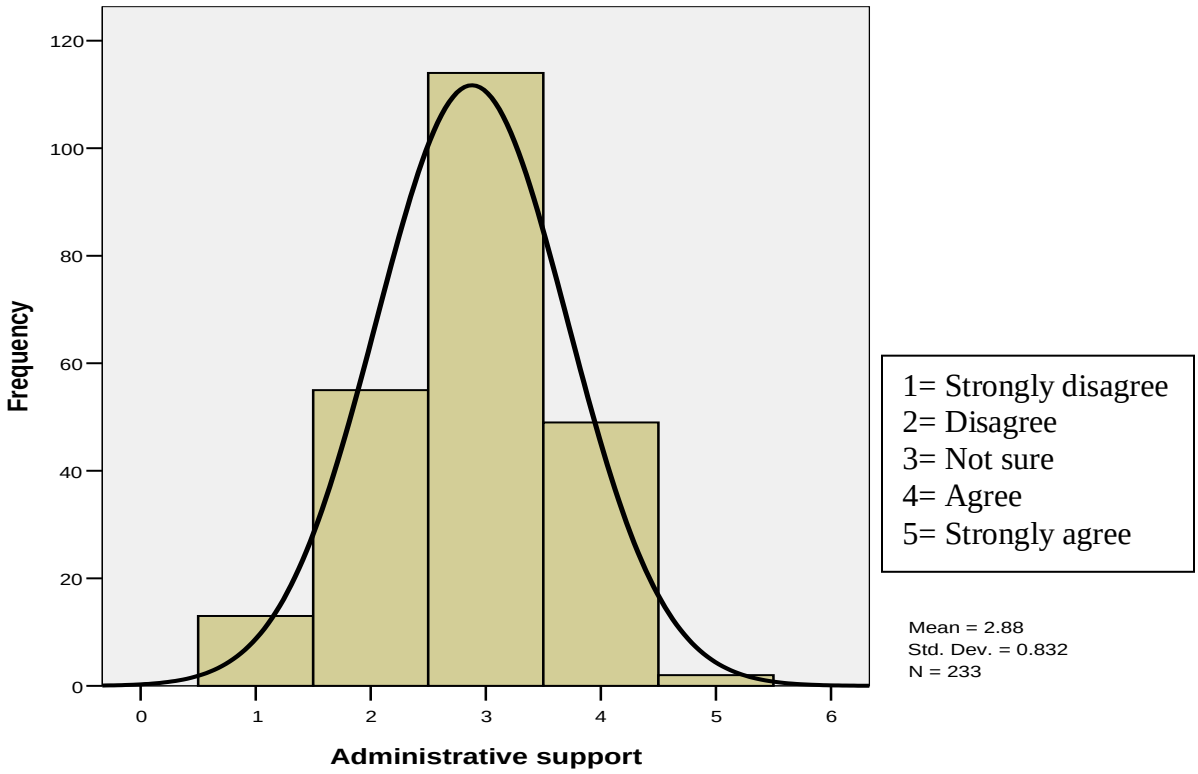
Table 4.22: Descriptive statistics on students' rating of administrative support (N=173)

Variable	Response	Frequency	Percent	Mean	Standard deviation
Financial support given to lecturers is enough	Strongly Disagree	10	5.8	3.06	.995
	Disagree	36	20.8		
	Not Sure	74	42.8		
	Agree	39	22.5		
	Strongly Agree	14	8.1		
Technical support given to lecturers is enough	Strongly Disagree	9	5.2	3.02	.921
	Disagree	38	22.0		
	Not Sure	72	41.6		
	Agree	48	27.7		
	Strongly Agree	6	3.5		
Managerial support given to lecturers is enough	Strongly Disagree	13	7.5	3.05	1.101
	Disagree	44	25.4		
	Not Sure	54	31.2		
	Agree	45	26.0		
	Strongly Agree	17	9.8		

As per table 4.22, using frequency and percentage, results indicate that students in this study were not sure of administrative support given to lecturers towards ICT training. Table 4.22 further indicates that students rated financial support as high with a mean of 3.06, with the least being managerial support with a mean of 3.02. However the three categories tended to the average rating of neither disagreeing nor agreeing since their arithmetic means were all above 3.0.

For purposes of obtaining an overall picture of how respondents rated administrative support, items in Table 4.21 and 4.22 were aggregated into one average index (Avsupp). Fig.4.6 illustrates administrative support given to lecturers using a histogram.

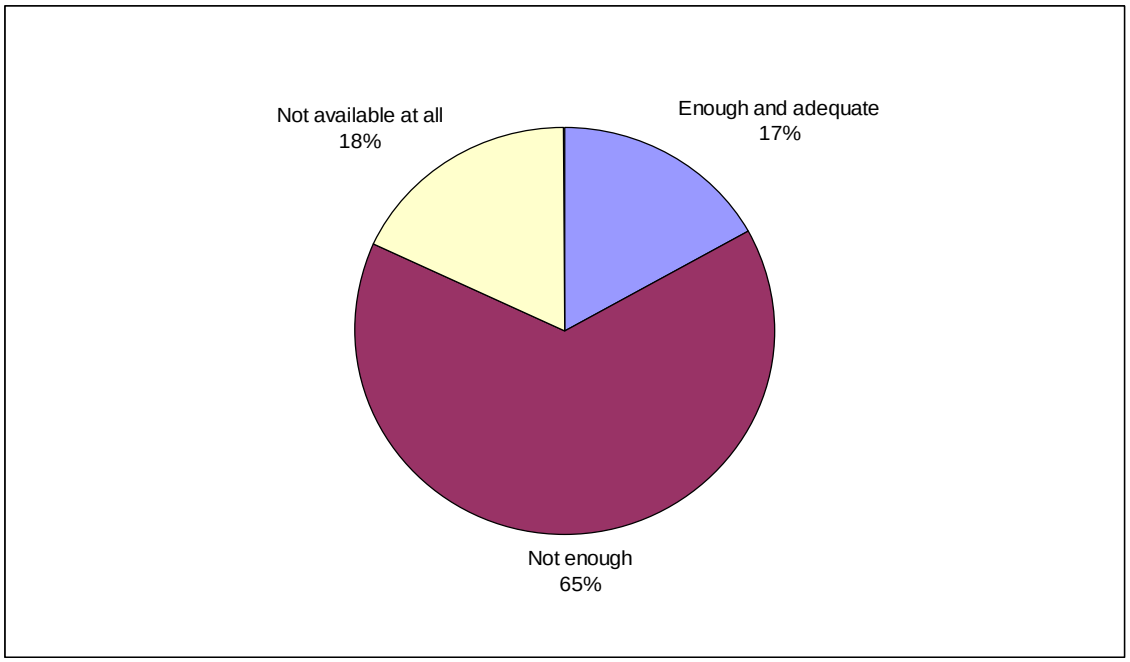
Fig. 4.6: Histogram showing normal curve for administrative support



Results from Fig. 4.6 indicate that respondents' rating on administrative concentrated mainly on category three (not sure) while category five (strongly agree) took the least portion. Lecturers and students in this study were mainly not sure of the administrative support given to lecturers towards ICT training.

Respondents in this study were requested to comment on administrative support given to lecturers towards ICT training. The opinions of the respondents were categorized under three major themes as; enough and adequate, not enough, and not available at all. According to opinion of Lecturers and students in this study, it was observed that administrative support was mainly not enough. Findings are presented in Fig 4.7

Fig. 4.7: Opinion of lecturers and students on administrative support



According to Fig 4.7, the “not enough” category took the largest option, with 153 (over 65%), where as the category “enough and adequate” took the least portion, with 39 (less than 18%). This indicates that administrative support given to lecturers towards ICT training was mainly not enough in the selected institutions of higher learning in Kabale District.

However, interviews carried out with all administrators of the four sampled selected institutions of higher learning in Kabale District show that institutions supported lecturers in ICT training in several ways including; providing finances towards organising seminars and workshops on ICT use, organising ICT short course programmes for teaching staff, sponsoring staff for further studies in ICT related courses under staff development policy, providing technical support by hiring professional experts, availing and upgrading of computer software, equipping computer laboratories with modern and up-to-date equipments, and ensuring that computers are connected to the internet. However, one administrator out of the 20 interviewed lamented that much as lecturers were supported in ICT training, some lecturers had negative attitude towards ICT training.

From documents reviewed in this study, Findings indicate that administrators supported lecturers for further studies and training was budgeted for. For example, in one of the four institutions sampled staff training was allocated 14 million Uganda shillings for the academic year 2008/9 and 40 million Uganda shillings was budgeted for purchasing computers and six million Uganda shillings was budgeted for recruiting an ICT administrator. Records further showed that 20 lecturers benefited from the staff development policy since 2002, but eight (8) out of those did not come back to the institution. In another institution, documents revealed that two lecturers

were sponsored for a computer course in computer repair and maintenance at Nakawa Vocational Institute in 2003 whereas another lecturer was sent to China for a course in database management and networking in 2005. Much as administrators were willing to support lecturers, the support did not cover all teaching staff and sometimes it was not enough due to limited budget and funds.

For purposes of testing hypothesis three, using the average index for ICT implementation (AvICTimp) generated in Section 4.2, the relationship between the two indices (AvSupp and AvICTimp) was developed using Pearson's Linear co-relation co-efficient. Statistical results on Pearson's correlation of administrative support and ICT implementation are shown in Table 4.23

Table 4.23: Pearson's Correlation of administrative support and ICT implementation

	Administrative support	**ICT implementation**
Pearson Correlation	1	.292(**)
Sig. (2-tailed)		.000
N	233	233

** Correlation is significant at the 0.05 level (2-tailed).

Results in Table 4.23 indicate a statistically significant relationship between administrative support and ICT implementation, since sign. Value of .000 is less than $\alpha = 0.05$. Administrative support has a positive relationship of 0.292 to ICT implementation. This implies that administrative support positively affected ICT implementation. Thus, the null hypothesis is rejected which states that administrative support does no enhance ICT implementation in selected institutions of higher learning in Kabale District. Therefore, administrative support enhances ICT implementation in institutions of higher learning in Kabale district.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

In this chapter, the findings from Chapter Four are discussed, conclusions drawn and recommendations made in line with the study research hypotheses. The purpose of this study was to investigate the extent to which problems influence ICT implementation in the selected institutions of higher learning in Kabale District.

5.1 DISCUSSION

In this section, findings about the hypothesis are presented.

5.1.1 Hypothesis One

Hypothesis One stated that the cost of ICT training materials does not enhance ICT implementation in selected institutions of higher learning in Kabale District. On testing the hypothesis, results revealed an insignificant relationship between cost of ICT training materials and ICT implementation, since a significant value of 0.484 was greater than $\alpha = 0.05$. Data analysis and responses from the respondents revealed that cost of ICT training materials negatively influenced ICT implementation in the selected institutions of higher learning in Kabale District. The co-relation index ($r = -.046$) being negative means that the higher the cost of ICT training materials, the minimal the ICT implementation (less use of computers in teaching). This finding is in direct relationship with those of earlier researchers such as Fracois (1997), cited in Zziwa (2001) in his paper on networking and use of information technologies in the French education system who found that the main obstacle to utilising computers in schools is

the high cost of computer peripherals. Aduwa-Ogiegbaen and Lyamu (2005) also found out that high cost of hardware and software applications leads to low integration of ICT in learning and teaching in Nigerian secondary schools. When the cost of ICT training materials is high, use of computers in teaching by lecturers becomes minimal, however as the cost goes down, lecturers increase their rate of teaching using computers. It can be argued that ICT implementation in developing countries like Uganda has proved to be expensive in terms of course development and course delivery. This is confirmed by Oliver, (2002), Sharma, (2003), and Mumtaz, (2000) who found out that financial resources and limited recourses as great impediment to take up ICT in the classroom. It is important to note that institutions of higher learning in Kabale District do appreciate the contribution of ICT towards performance of their staff, but various barriers such as high cost of hardware and software are a hindrance to their progress. This indicates that in order to increase ICT usage in institutions of higher learning, the costs on computers, charges on internet and other consumables should be lowered as put forward by Ssewanyana and Busler, (2007) and Namukangula (2007).

Furthermore, from the findings in this study as presented in Chapter four, it could show that much as the cost of ICT training materials negatively affected ICT implementation, the cost of ICT training materials was not so high. This is indicated by 27% of the respondents who were interviewed and according to their opinion; cost of ICT training materials was not considered as high. This was also confirmed by 10% of administrators who were interviewed and who agreed that cost of ICT training materials was cheap. It can be argued that the higher cost of ICT training materials could not alone affect ICT implementation. This is confirmed by Ensafi et al, (2007) who reported that the main obstacles in the growth of e-learning in Iran is not the high

price of computers, but rather lack of government budgets for equipping universities, schools and public places with new computers and suitable hardware infrastructure. It can be put forward that besides cost of ICT training materials, other problems such as lecturers' perception, individual characteristics and students' attitude towards ICT training could be a hindrance to ICT implementation in institutions of higher learning in Kabale District. This is also confirmed by Bakkabulindi (2008) and Malcolm and Godwilly (2008). Namukangula (2007) reported that acquisition of computers in an organization does not increase the rate at which teachers use computers in teaching in their specific areas. Institutions of higher learning need to set up local network, increase on technical assistance and training of staff so that ICT can effectively be implemented. This in agreement with the findings of ZZiwa (2001) which indicated that computer utilization is affected by training and supply of resources. Aryatuha (2007) reported that cost of ICT tools would not be considered a problem if African economies were not poor and thus lack resources. Much as the cost of ICT training materials might be low, lack of resources could be a hindrance to ICT implementation in institutions of higher learning in Kabale District. This is in agreement with the findings of Makau (1986) and Mumtaz (2000) which indicated that limited financial resources within schools are great impediment to take up ICT. This indicates that the question of high cost of ICT training materials should not be taken as a significant issue in influencing ICT implementation in institutions of higher learning in Kabale District. Moreover, staff in institutions of higher learning are not using computers in teaching because of high cost but due to other limiting problems such as age, negative attitude, lack of time and fear of new technology.

From findings in this study, it would appear that the cost of ICT training materials was considered as very high. This could imply that for ICT implementation to be optimal, prices of ICT training material have to be reduced so that institutions can be able to purchase many ICT tools to use in teaching. It can be argued that with the increase in prices of computers, most institutions cannot afford to purchase enough computers, thus limiting the number of lecturers using computers in teaching. Furthermore, interview results among administrators in the sampled selected institutions of higher learning in Kabale District revealed that the cost of ICT training materials was very high. Once prices for ICT training materials are high, few ICT tools can be bought by institutions of higher learning, thus hindering use of computers in teaching due to scarcity of ICT resources. This could imply that the cost of ICT training materials was a barrier for lecturers to teaching using computers. This finding is confirmed by the Republic of Uganda (2007), Lyamu (2005) and Sharma (2003) who reported that the higher the cost of computers and their accessories, the fewer computers one can buy with the limited resources. ICT tools have proved to be quite high in terms of infrastructure, course development and course delivery (Oliver, 2002). To increase accessibility to ICT tools, stakeholders in institutions of higher learning need appropriate information related to costs of computers so that alternative means of acquiring cheap peripherals can be sought.

5.1.2 Hypothesis Two

Hypothesis Two stated that skills development in ICT does not enhance ICT implementation in selected institutions of higher learning in Kabale District. On testing the hypothesis, results revealed a significant relationship between skills development in ICT and ICT implementation, since a significant value of 0.000 was less than $\alpha = 0.05$. Data analysis and responses from the

respondents revealed that skills development in ICT positively influenced ICT implementation in selected institutions of higher learning in Kabale District. The co-relation index (r = 0.319) being positive means that the higher the skills in ICT, the more optimal the ICT implementation (more use of computers in teaching). This finding agrees with those of earlier researchers such as Knezek and Christensen (2002) who found out that educators with higher levels of skill, knowledge, and tools exhibited higher levels of technology integration in the classroom. This finding also is in agreement with those of Windschitl and Sahl (2002), Hawkins (2002), Walker (2005) and Munyantware (2006), who found out that teachers with lower technology proficiency are usually not willing and have less confidence to use ICT for teaching. Teachers who have strong engagement towards their own professional development are more motivated to undertake activities which lead to a better understanding of the goals of an innovation. This is confirmed by Fullan (1992) and Odongo (2007) who stated that teachers who are actively involved in their ICT professional development are able to implement changes in their teaching. Teachers and students should gain ICT skills through the programme training and practice including knowledge to use, access and utilize information (Bates, 1997, Nachmaias et al, 2004). This however requires information programmes and strategies to be integrated in tertiary and university programmes and plans. Busch (1996) summarises strategies of information literacy in ICT as staff development and curriculum development. It can be urged that acquisition of ICT skills is an important issue as it makes the innovation easy to be tried by teachers in their teaching. This would imply that where an innovation is more observable than others, adoption and implementation by teachers becomes quicker.

On the other hand findings in this study disclosed that to some extent, acquisition of skills in ICT may not guarantee most favorable ICT implementation. This is confirmed by Bauer and Kenton (2005) who stated in their study that although teachers had sufficient skills, were innovative and easily overcame obstacles, they did not integrate technology consistently both as a teaching and learning tool. This scenario could be attributed to other problems such as outdated hardware, lack of appropriate software, technical difficulties and student skills levels. This could imply that acquisition of skills in ICT in the selected institutions of higher learning in Kabale District was mainly by taking a course at an educational institution where a person is officially registered.

However, findings in this study exposed that most lecturers did not have ICT skills in institutions of higher learning in Kabale District. It can be argued that much as ICT is emphasized in the institutions of higher learning, most of the lecturers have failed to use ICT in teaching. This could imply that lack of ICT skills leads to minimal ICT use in the selected institutions of higher learning in Kabale District. Lecturers who lack skills in ICT may fear to use computers even when they are readily available and accessible to them. This finding is supported by Priscilla et al (2008) who found out that lack of technical skills of maintaining the functionality of computers confused teachers to integrate technology in the classroom. Functionality of computers that confused teachers to integrate information communication technology is line with the characteristics of innovation regarding complexity of an innovation as advanced by Rogers (2003) which states that excessive complexity of an innovation is an important obstacle to its adoption. Munyantware (2006), in support of the statement indicated that technological innovation might confront faculty members with the challenge of changing their teaching methodology to integrate the technological innovation into their instruction. This would mean

that if computer hardware and software are user-friendly, then they might be adopted successfully for the delivery of course materials. In Kabale District, it is assumed that most teachers lack the competence and confidence in their ICT skills. This finding agrees with those of earlier researchers such as Mooj and Smeets (2001) and Albirini (2006) who found that teachers' competence and confidence in their ICT skills were major problems that could influence teachers to integrate ICT in the teaching-learning process. Teachers might change their attitude towards ICT in order to attain and maintain an assured degree of technological competence to make instructional strategies more effective.

Also results in this study revealed that lecturers were helped to identify their ICT training needs in selected institutions of higher learning in Kabale District. Much as the lecturers were helped to identify their training needs in ICT, findings indicated that very few lecturers used computers in teaching**.** This could imply that much as ICT training was emphasized to equip lecturers with ICT skills, very few lecturers were able to use computers in teaching. This scenario could be attributed to problems such as; lack of ICT tools, lack of specific software, and inadequate curriculum that does not demand lecturers to use computers in teaching all the courses. Due to absence of relevant softwares, it can be argued that lecturers do not use computers since they may not be having the sufficient ICT skills in computer use. Findings in this study are in support with Roger's (2003) Diffusion Theory which states that if the perceived advantage to the use of an innovation is positive, there is a greater likelihood that it will be adopted easily. It can be argued that the possibility of increased incomes and reduced cost and other problems could make adopting innovation advantageous over others. Through frequent ICT training support, teachers who are not users of educational technology are more likely to have positive attitudes toward

ICT and initiate change in their teaching practice. This could in turn increase the percentage of teachers using computers in teaching in institutions of higher learning.

Furthermore, results in this study indicated that ICT skills development was very low as rated by students and lecturers (Fig. 4:5). Acquisition of ICT skills is presumed to be by taking a course an educational institution where a person is officially registered. Due to low ICT skills, there is need for institutions of higher learning in collaboration with the Ministry of Education and Sports to put in place programme to help teachers incorporate ICT in their teaching process. This is in agreement with findings of Fullan (1998) which found out that for technology to be effectively incorporated into teacher preparation programs, teachers should complete a well planned sequence of courses. This is confirmed by Auerswald and Magambo (2007) who indicated that teachers must be given ICT training that enables them to integrate new information communication technologies into their teaching programs. However, Teo and Leo (1998) reported that due to lack of educational and technical training, teachers' competence to handle ICT would be very low. Teachers should be trained how to use computers in teaching but not to operate computers. This indicated that while many teachers may know how to operate computers but few of them would know how to use them in teaching. Teachers' training programs should focus more on integrating ICT into teaching than mere acquisition of basic computer skills. Therefore, teachers need to develop their competence in ICT skills through training based on educational goals they want to accomplish in order to make use of computers in teaching.

5.1.3 Hypothesis Three

Hypothesis Three stated that administrative support does not enhance ICT implementation in selected institutions of higher learning in Kabale District. On testing the null hypothesis, results revealed a significant relationship between administrative support and ICT implementation, since a significant value of 0.484 was greater than $\alpha = 0.05$. Data analysis and responses from the respondents revealed that administrative support positively influenced ICT implementation in the selected institutions of higher learning in Kabale District. The co-relation index ($r = 0.292$) being positive means that the more the support towards ICT training, the optimal the ICT implementation (more use of computers in teaching). This finding is in direct relationship with those of earlier researchers cited in Chapter Two such as Kariuki (2004) who found out that educators who received constructive support from administrators were more likely to use technologies in their teaching practice while those who received poor support or encouragement from higher authorities in school were less enthusiastic in using computer or did not integrate technology at all. Furthermore, Yang (2008) confirmed that lack of technical support was one of the major barriers that resulted in computers being underutilized in the classes. It can be urged that lack of training support by administrators could be identified as a significant barrier towards implementation of computers in classrooms as supported by Krysa (1998), Yang (2008) and Priscilla et al (2000). Findings in this study also indicated that successful implementation of computers could only occur if administrators offer lecturers support and leadership (Karuiki, 2004; Hawkins, 2004 and Odongo, 2007). This scenario would imply that administrators in the institutions of higher learning could be vigilant in supporting and championing ICT training. However, administrators in certain cases also lack the knowledge on how to deal with ICT tools and thus find it difficult to support the staff. This is emphasized by Sife et al (2003) and Tusubira

and Mulira, (2004) who found out that for the adoption of ICT to be effective and sustainable, administrators themselves must be competent enough in the use of technology and must have a broad understanding of the technical and pedagogical dimensions of ICT in education.

Findings further showed that the administrative support given to lecturers in relation to ICT training was not enough in selected institutions of higher learning in Kabale District. This could signify that administrative support given to lecturers in relation to ICT training was mainly not enough and thus minimal ICT implementation. Findings in this study indicated that continuous training is not provided from which lecturers could continue to keep update with ICT and its application to subject pedagogy, in order to enhance their teaching skills (Mbulakende, 2007; Aryatuha, 2007). It can be argued that most lecturers are not introduced to and trained on how to use various ICT tools common in the classroom such as projectors, computers, electronic white boards, and digital cameras. Trouble shooting minor problems common with these facilities would also be a challenge among teachers. Lack of appropriate strategies of ensuring that integration of ICT in teaching and learning process goes together with the recruitment, training and retention of staff, negatively affects ICT implementation. This would imply that any innovation may not successfully work if administrators do not embrace it. Walker (2005) reported that the failure of ICT change derives from the traditional beliefs of managers who think that technology is a magic bullet.

Furthermore, findings from this study revealed that much as institutions of higher learning supported lecturers in ICT training in several ways as presented in Chapter Four, some lecturers had negative attitude towards ICT training and ICT implementation. This would imply that

administrative support alone may not be enough to influence ICT implementation; it has to be accompanied by other factors such as; age, commitment and attitude of lecturers. Innovations that offer advantages, compatability with existing practices, low complexity, potential triability and observability will have a more wide spread and rapid rate of diffusion. This is in support of the innovation theory which stipulates that if the use of an innovation is positive, there is a greater likelihood that it will be adopted rapidly.

The study established that administrators supported lecturers for further studies. This was observed from documents reviewed where in all the four institutions sampled, staff training was budgeted for as presented in Chapter Four. However, much as lecturers were supported, use of computers in institutions of higher learning remained minimal as advanced by Bakkabulindi (2008) and Republic of Uganda (2007). This scenario could be attributed to other problems such as lack of resources, negative attitude of lecturers towards ICT training, limited access to ICT tools, limited time and lack of motivation. It can be put forward that for effective ICT implementation to take place; administrative support needs to be accompanied by other complementary factors (Krysa, 1998 and Hsin-kai et al, 2007).

5.2 CONCLUSIONS

The following issues emerged from the study:

- The cost of ICT training materials was mainly high. There were few computers and peripherals compared to students enrolment.
- Very few lecturers were using computers in teaching and most of the lecturers had low ICT skills.

- Provision of administrative support towards ICT training in form of finance, technical and managerial was very minimal**.**

According to the above findings, the following conclusions were made:

With regard to the cost of ICT training materials and ICT implementation, there was a statistically insignificant relationship between the two variables. Cost of ICT training materials negatively affected ICT implementation. Hence, the higher cost of ICT training materials ICT implementation is likely to be minimal and vice versa.

In respect to skills development in ICT and ICT implementation, there was a statistically significant relationship between the two variables. Skills development in ICT positively affected ICT implementation. With excellent skills development in ICT, ICT implementation is likely to be at its maximum and with poor skills development in ICT, use of computers in teaching may be low.

In regard to administrative support and ICT implementation, there was a statistically significant relationship between the two variables. Administrative support appeared to positively affect ICT implementation. With adequate administrative support towards ICT training, lecturers are able to use computers in teaching and vice versa.

5.3 RECOMMENDATIONS

In line with the findings and the conclusion emerging from the study, the following recommendations are made:

(i) To address the problem of high cost of ICT training materials, there is need for stakeholders to standardize on hardware and software and negotiate best prices with reliable vendors which may include ICT training in the purchase price. Institutions of higher learning could exploit the possibility of complementary peripheral devices so that there is saving in hardware and software costs. Institutions could take advantage to share Web-based resources and training materials with other training institutions. Institutions of higher learning could consider acquisition of open source software and wireless connectivity solutions using Global System for Mobile (GSM) Networks, which may cheap and have a wider coverage in the country. There is an explosion of new technologies that are promising to drastically lower the cost of entry and ownership of ICT in institutions. Thus, reducing the cost of technology, including equipment, internet access, etc, could greatly improve teaching using computers. The Government of Uganda to explore the possibility of quickly expediting the national back bone policy so as to reduce on the high cost of internet.

(ii) To overcome the problem of poor and lack of skills in ICT, institutions of higher learning could be encouraged to employ a variety of teacher training methods, ranging from face-to-face workshops to online self study programs depending on training objectives and environments. Lecturers could be enabled to physically be in touch with ICT tools in order to increase skills and expertise in it. Users will need basic computing and ICT skills before they can make use of access initiatives. Therefore, appropriate training could be provided for those accessing and using information communication technologies.

The Ministry of Education and Sports (MoES) and National Curriculum Development Centre (NCDC) to explore the possibility of expanding the national curriculum to include ICT topics at

the primary, secondary and higher education levels which will help to produce school leavers that not only have a high level of basic educational competence, but also good ICT skills to enable them venture into other educational pursuits. All institutions of higher learning could be encouraged to have an ICT policy and master plan which could include a component for training users. Considerable knowledge and skills have to be developed among the end users so that they are able to use ICT services and systems effectively and as independently as possible, contribute to the specification design and implementation of ICT use and be aware of the shared responsibility for equipment, software and data, and enforce an atmosphere of collective responsibility and system ownership.

(iii) To overcome the problem of inadequate administrative support, administrators of institutions of higher learning could be encouraged to integrate informal support into the formal teacher training system so that the less experienced lecturer trainers can obtain timely assistance. Support and investment in lecturer trainer training is important for the adoption of ICT for lecturer training. Institutions of higher learning may find it worthwhile to plan to provide multiple incentives such as workload reduction, recognition and reward in faculty evaluations, increased research allocations to encourage use of ICT in teaching, and compensation for those providing educational or technological assistance to others. On the other hand, appointing an ICT coordinator or head of the ICT department in each institution helps to assure administrative and pedagogical support for the lecturers. The ICT coordinator or head of department could advise lecturers on ICT solutions to their teaching or learning problems, help lecturers to acquire ICT resources, and conduct training needs assessment of lecturers' ICT-related capacities and advise them on their professional development. Institutions of higher learning could exploit the

possibility of availing computer hardwares, softwares, internet connections and technical personnel to lecturers in their respective places of work in order to improve on their professional skills.

5.4 Areas for further research

The study focused on the three problems influencing ICT implementation in the selected institutions of higher learning in Kabale District. Further research is thus recommended on the replica of this study to be conducted in other higher institutions of learning in other districts in Uganda. This will help in establishing the general trend of the investigated variables to improve on ICT implementation in institutions of higher learning in Uganda.

Research could be conducted on other variables such as lecturers' perception, and individuals' characteristics, students' ICT skills and attitude that may affect ICT implementation in institutions of higher learning in Uganda, East Africa and even beyond.

REFERENCES

Aduwa-Ogiegbaen, S. E. and Lyamu, E. S. (2005). Using information and communication technology in secondary schools in Nigeria: Problems and prospects. Educational Technology and Society, 8 (1), 104-112.

Afshari, M., Kamariah, A., Wong, S. L., Samah, A. B. and Fooi, F. S. (2009). Factors affecting teachers' use of information and communication technology. International Journal of Instruction, *2* (1)

Agaba, D. (2003). Utilization of Makerere University library information resources by academic staff: Challenges and the way forward. Unpublished Masters Dissertation, Makerere University, Kampala, Uganda.

Akankwasa, P. (2008). Problems affecting the level of computer use for instructional purposes by technology teachers in government schools in Uganda. Unpublished Bachelors' research, Uganda Christian University, Mukono, Uganda.

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies. Journal of Computer and Education, 47, 373-398

Amin, M. E. (2005). Social science research: conception, methodology and analysis. Kampala: Makerere University Printery.

Aryatuha, H. (2007). Relationship between computerization and organizational effectiveness in day today running of business at MOH Headquarters in Kampala. Unpublished Masters Dissertation, Makerere University, Kampala, Uganda.

Auerswald, M. and Magambo, J. (2007). Fostering ICT use in teacher education in Africa.

Bagchi, K. and Godwin, U. (2007). Factors that affect the adoption of information and communication technology in Africa and OECD set of nations. University of Texas, *3* (2).

Bakkabulindi, F. (2008). Individual characteristics affecting use of computers in Makerere University. Unpublished research guidelines for Masters' students (Educ). Makerere University, Kampala, Uganda.

Bates, A. W. (1997). Technology, open learning and distance education. (4th ed), London: Routledge.

Bauer, J. and Kenton, J. (2005). Towards technology integration in the schools: why it isn't happening. Journal of Technology and Teacher Education. 13 (4), 519-546.

Beebwa, E. (2007). Selection of secondary school teachers and students' academic performance in Mukono town council. Unpublished Masters Dissertation, Makerere University, Kampala, Uganda.

Braak, J. V. (2001). Individual characteristics influencing teachers' class use of computers. Journal of Educational computing research, 25(2), 141-157.

Brock, C. J. (2000). Surviving Change: A Survey of Educational Change Models, Syracuse, NY: ERIC Clearing House on Information and Technology.

Busch, T. (1996). Gender group composition and self-efficacy in computer studies. Journal of Educational Computing Research, 15 (2), 125-135.

Cameron K. S., and Ulrich, D. O. (1986). Transformational leadership in colleges and universities. Higher education: Handbook of Theory and Research. New York: Agathon Press, 2 (1), 1-42.

Dalton, D. W. (1989). Computers in the schools: A diffusion/adoption perspective. Educational Technology, *29* (11), 20-27.

Ensafi, R., Zamiri, A., and Kahani, M. (2007). ICT challenges in education. Reflections from a developing country: Iran, with reference to the statistics from computer science students. The 2nd International Conference on Virtual Learning, Ferdowsi University, Mashhad, Iran.

Ensminger, D. C., Surry, D. W., Porter, B. E., and Wright, D. (2004). Factors contributing to the successful implementation of technology innovations. Educational Technology and Society, 7 (3), 61-72.

Farrell, G. and Shafika, I. (2007). Survey of ICT and education in Africa: A summary report based on 53 country surveys. Washington, DC: info/Dev/World Bank. http://www. infodev.org/org/en/publication.353.html 16/10/2008

Farrell, G. (2007). Survey of ICT and education in Africa: Uganda country report. http:// www.infodev.org 5/11/2008

Free Online Dictionary (nd). http://www.thefreedictionary.com/training.

Hawkins, J. R. (2002). Ten lessons for ICT and education in the developing world. World links for development.

Hornby, A. S. (2006). Oxford Advanced Learner's Dictionary.(7th Ed). India, Oxford University press

Hsin-Kai, W., Ying-Shao, H. and Fu-Kwun, H. (2007). Factors affecting teachers' adoption of technology in classrooms: Does school size matter? International Journal of Science and Mathematics Education, 6: 63-85

Kariuki, M. (2004). Factors influencing pre-service teachers' use of laptops for teaching/learning purposes during practicum. European Journal of Social Sciences 7, (1) (2008)

Katundu, D. (2000). The use and sustainability of Information Technology (IT) in academic and research libraries in Tanzania. Unpublished Ph.D.Thesis. Pietermaritzburg, University of Natal.

Katushabe, A. and Kisambira, E. (2002). E-learning face with daunting challenges in Uganda. http: // www.iconnect online.org. Retrieved on 25/3/2009

Kasozi,A.B.K (2003). Univeristy education in Uganda. Challenges and opportunities for reform. Kampala, Fountain.

Keeves, J. (1988). Education research methodology and measurement; An international handbook, New York: Pergamon press oxford.

Kim, E. G. (1999). Towards a holistic model for the diffusion of education technologies in USA. Educational Technology and Society, 2 (4)

Knezek, G. and Christensen, R. (2002). Impact of new information technologies on teachers and students. Education and Information Technologies, *7* (4), 369–376.

Krysa, R. (1998). Factors affecting the adoption and use of computer technology in schools, University of Saskatchewan. http://www.usak.ca/education/ coursework /802 papers / krysa.pdf 7/05/2009

Magambo, J. (2007). Use of Information and Communications Technologies (ICTs) in teacher education in Sub-Saharan Africa: Case studies of selected African universities. http:// deposit.ddb.de/cgi-bin.pdf. Retrieved on 13/3/2009

Makau, B. M. (1986). Barriers to the uptake of web based technology by university lecturers. Journal of Distance Education, 16 (1), 70-84.

Margaret, P. (1995). Social science research methods: a hand book for Africa, (2nd ed), Nairobi: Educational publishers ltd.

Malcolm, E. and Godwyll, F. (2008). Diffusion of information communication technology in selected Ghanaian schools, Unpublished Doctoral dissertation, Ohio University, USA

Markus, M. L. (1987). Towards a 'Critical Mass' Theory of Interactive Media: Universal access, interdependence and diffusion. Communication Research, 14 (5), 491-511.

Mbulankende, J. S. (2007). An assessment of teacher training in ICT in selected universities in Uganda: A case study of post graduate diploma students in education trainees. Unpublished Masters Dissertation, Makerere University, Kampala, Uganda.

Mooij, T. and Smeets E. (2001). Modelling and supporting ICT implementation in secondary schools. Computers and Education, 36, 265–281.

Mugisha, B. (2007). Problems affecting ICT implementation in the curriculum of core primary teachers in Kabale District. A case study of Bukinda core primary teachers' college. Unpublished Bachelors' research, Mbarara University of science and technology, Mbarara, Uganda.

Mulamira, A. D. (nd). Assessment of the utilization of Makerere University electronic information resources by academic staff: Challenges and prospects. http://www.up.ac.za/ dspace/bitstream/agaba.pdf. Retrieved on 16/10/2008

Mumtaz, S. (2000). Factors affecting teachers' use of information communications technology: A review of the Literature Technology, Pedagogy and Education, 9 (3), 319-342.

Munyantware, D. B. (2006). Problems affecting teacher's adoption of technology in classrooms in secondary schools in Kisoro District. Unpublished Bachelors' research, Uganda Christian University, Mukono, Uganda.

Nachmis, R., Mioduser, D., Chen, A., Tubin, D. and Forkosh-Bruch, A. (2004). Factors involved in the implementation of pedagogical innovations using technology.

Namukangula, J. K. (2007). Relationship between desk top characteristics and adaptation to ICT in learning in selected universities in Uganda. Unpublished Masters Dissertation (MEIT), Makerere University, Kampala, Uganda.

Odongo, M. (2007). ICT integration and its influence on teaching-learning process in selected secondary schools in central Uganda. Unpublished Masters Dissertation, Makerere University, Kampala, Uganda.

Oliver, R. (2002). The role of ICT in higher education for the 21st century. ICT as a change agent for education. HE21 conference proceedings, Edith Cowan University, Australia.

Omwenga, E. (2007). Pedagogical issues and issues E-learning cases: Integrating ICTs into teaching and learning process. Nairobi University, Kenya.

Peansupap, V. and Walker, D. H. T. (2005). Factors enabling information and communication technology diffusion and actual implementation in construction organisations, Australia. http: //www.i tcon. Org. Retrieved on 14/11/2009

Priscilla, M., Nida, M., Khambari, M. and Wong S. L. (2008). Factors that could possibly influence the use of laptops among educators. European Journal of Social Sciences, 7 (1), 114

Republic of Uganda (2002). National Information and Communication Technology Policy. Kampala, Uganda

Republic of Uganda (2007). National Information and Communication Technology Policy. Kampala, Uganda

Rogers, E. M. (1983). Diffusion of Innovations. New York, NY: The Free Press.

Rogers, E. M. (2003). Diffusion of Innovations. (5th ed). New York, NY: The Free Press.

Sahin, I. (2006). Detailed review of Roger's diffusion of innovations theory and educational technology. The Turkish Online Journal of Educational Technology, 5 (1), 1303-6521.

Salih, U. (2004). Factors affecting the application of information and communication technologies in distance education in Turkey. Turkish Online Journal of Distance Education, *5* (1).

Sarantokos, S. (1997). Social research (2nd ed), Palgrave Publishers limited.

Saunders, M., Lewis, P and Thorndike, A. (2003). Research methods for business students. 3rd ed. Pearson education limited, New Delhi.

Sharma, R. (2003). Barriers in using technology in developing countries, IEEE 0-7803-7724-9103

Sife, A. S., Lwoga, E. T. and Sanga, C. (2007). New technologies for teaching and learning: Challenges for higher learning institutions in developing countries. International Journal of Education and Development using Information and Communication Technology, 3 (2), 57-67

Soanes, C. (2006). Oxford dictionary of current English (4th Ed), New York: Oxford University press Inc.

Ssewanyana, J. and Busler, M. (2007). Adoption and usage of ICT in developing countries: Case of Ugandan firms. International Journal of Education and Development using Information and Communication Technology (IJEDICT*)*, 3 (3), 49-59

Surry, D. W. and Ely, D. P. (2001). Adoption, diffusion, implementation, and institutionalization of educational innovations. In R. Reiser and J. V. Dempsey (Eds.), Trends

and Issues in Instructional Design and Technology (pp. 183-193), Upper Saddle River, NJ: Prentice-Hall.

Teo, S. H. T. and Lim, K. G. V. (1998). Factors influencing desk top computer usage among novice and experienced users. Journal of Information Technology Management, 10, (1).

Tusubira, F. and Mulira, N. (2004). Integration of ICT in organizations: Challenges and best practice recommendations based on the experience of Makerere University and other organizations, Paper presented at the International ICT Conference held at Hotel Africana, Kampala, Uganda. 5th to 8th September, 2004.

UNESCO (2005). Global Digest 2005. Comparing Education Statistics Across the World. http://www.uis.unesco.erg/template pdf. Retrieved on 18/08/2009.

Windschitl, M. and Sahl, K. (2002). Tracing teachers' use of technology in a laptop computer school: The interplay of teacher beliefs, social dynamics, and institutional culture. American Educational Research Journal, 39 (1), 165-205.

Yang, Y. (2008). Examining university students' and academics' understandings of ICTs in higher education. Paper presented at the annual meeting of the Australian association for research in education, Brisbane, Australia.Nov.30, 2008-Dec 4, 2008.

Zziwa, G. (2001). Computer utilization in the management of students' information at Makerere University. Unpublished Masters Dissertation, Makerere University, Kampala, Uganda.

APPENDIX A

Sample size (S) required for the given population sizes (N)

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	256	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Note: From R.V.Krejcie and D.W. Morgan (1970). Determining sample size for research activities, educational and psychological measurement, 30, 608, Sage Publications.

Source :(Bakkabulindi, 2008: Amin, 2005:454)

APPENDIX B

SELF ADMINISTERED QUESTIONNAIRE FOR LECTURERS IN SELECTED INSTITUTIONS OF HIGHER LEARNING IN KABALE DISTRICT ON PROBLEMS INFLUENCING ICT IMPLEMENTATION

East African Institute of Higher Education

Studies and Development,

School of Education,

Makerere University

1st June, 2009

Dear Prof/Dr/Mr/Ms

Iam a Masters student carrying out a survey on Problems influencing ICT implementation in selected institutions of higher learning in Kabale District. The questionnaire is for teaching staff like you, it is intended to get your opinion. It is against this background that you have been randomly selected to participate in the research by completing the questionnaire. It would thus be helpful if you assist by answering the questions as per the instructions at the beginning of each section. You should provide the most appropriate answer in your opinion. Your responses will be kept confidential. In any case the questionnaire is anonymous. Please endevour to fill the questionnaire within two weeks and return it to Mr.Turyasingura, Mr. Rurisa, Mr. Sendegeya, and Mr. Akuma in your college/university. Thank you. Yours truly,

Justus Ariho Twinomujuni

Researcher

Section A BACKGROUND VARIABLES

Please help us classify your responses by supplying facts;

A1 Your Faculty …… … (Where applicable)

A2 Your Department……

A3 Your gender. 1 = Male 2 = Female

A4 Your age group (Years) 1 = 20-30; 2 = 31-40; 3 = 41-50; 4 = 51 and above

A5 Your designation 1.Professor; 2.Assoc.Prof; 3.Principal lecturer; 4.Senior Lecturer; 5.Lecturer; 6.Assist. Lecturer

Section B: INDEPENDENT VARIABLE: PROBLEMS

Training in ICT helps lecturers to use computers in their teaching; however the cost of ICT training materials may be a hindrance to computer use. Please rate how costly you find the following aspects of computers using a scale where 1= Strongly disagree; 2 = Disagree; 3 =Not sure; 4 =Agree; 5 = Strongly agree.

B1 Cost of ICT training materials

B1.1	Purchase price is high	1	2	3	4	5
B1.2	Installation cost is high	1	2	3	4	5
B1.3	Maintenance fee is high	1	2	3	4	5

B1.4 Briefly, comment on the cost of ICT training materials in your institution.

……

……

……

……

B 2 Skills development in ICT

B 2.1 How do you rate your skills development in ICT at the following levels in you academic career? Use a scale where 1 = Poor; 2 = Fair; 3 =Good; 4 = Very Good; 5 = Excellent.

B2.2	Ordinary level	1	2	3	4	5
B2.3	Advanced level	1	2	3	4	5
B2.4	Tertiary Level	1	2	3	4	5

B2.5 How are skills in ICT acquired in your institution?.....

……

……

B3 Administrative support

The University/College supports me in ICT training with relevant and enough resources. Please rate how administrators help you in ICT training under the following aspects of support using a scale 1= Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree.

B3.1	Financial support	1	2	3	4
B3.2	Technical support	1	2	3	4
B3.3	Managerial support	1	2	3	4

B3.4 In summary, comment on the administrative support given to you by your institution in ICT training

……

……

……

C: DEPENDENT VARIABLE: ICT IMPLEMENTATION

Please rate how often you use a given ICT facility using a scale where 1 = Very rarely; 2 = Rarely; 3 = Regularly; 4 = Very regularly.

C1 Computer hardware and peripherals:

C1.1	Desk top computers	1	2	3	4
C1.2	Projectors	1	2	3	4
C1.3	Printers	1	2	3	4
C1.4	Scanners	1	2	3	4
C1.5	White boards	1	2	3	4

C2 Computer soft ware:

C2.1	Word processing	1	2	3	4
C2.2	Spread sheets (e.g. Excel, Lotus)	1	2	3	4
C2.3	Data base management (e.g. Ms-access, dbase	1	2	3	4
D2.4	Power Point	1	2	3	4
C2.5	Accounting software (e.g. Pastel, Tally, Quick books)	1	2	3	4

C2.6 Specify any other software(s) you are familiar with……

C3 Internet:

C3.1	E-mail (sending and receiving messages)	1	2	3	4
C3.2	Electronic learning	1	2	3	4
C3.3	Electronic journals (in library)	1	2	3	4

C3.4 Specify any other internet facility(s) you are familiar with……

APPENDIX C

SELF ADMINISTERED QUESTIONNAIRE FOR STUDENTS IN SELECTED INSTITUTIONS OF HIGHER LEARNING IN KABALE DISTRICT ON PROBLEMS INFLUENCING ICT IMPLEMENTATION

East African Institute of Higher Education

Studies and Development,

School of Education,

Makerere University

1st June, 2009

Dear Mr/Ms

Iam a Masters student carrying out a survey on Problems influencing ICT implementation in the selected institutions of higher learning in Kabale District. The questionnaire is for students like you. It is against this background that you have been randomly selected to participate in the research by completing the questionnaire. It would thus be helpful if you assist by answering the questions as per the instructions at the beginning of each section. You should provide the most appropriate answer in your opinion. Your responses will be kept confidential. In any case the questionnaire is anonymous. Please endevour to fill the questionnaire within two weeks and return it to Mr.Turyasingura, Mr. Rurisa, Mr. Sendegeya, and Mr. Akuma in your institution. Thank you

Yours truly,

Justus Ariho Twinomujuni

Researcher

Section A BACKGROUND VARIABLES

Please help us classify your responses by supplying facts;

A1 Your Faculty …….. (Where applicable)

A2 Your Department ……..

A3 Your age group (years) 1 = 20-30; 2 = 31-40; 3 = 41-50; 4 = 51 and above

A4 Gender 1= Male 2= Female

Section B: INDEPENDENT VARIABLE: PROBLEMS

Training in ICT helps lecturers to use computers in their teaching; however the cost of ICT training materials may be a hindrance to computer use. Please rate how costly you find the following aspects of computers using a scale where 1= Strongly disagree; 2 = Disagree; 3 =Not sure; 4 =Agree; 5 = Strongly agree.

B1 Cost of ICT training materials

B1.1	Purchase price is high	1	2	3	4	5
B1.2	Installation cost is high	1	2	3	4	5
B1.3	Maintenance fee is high	1	2	3	4	5

B1.4 Briefly, comment on the cost of ICT training materials.

……...

……..

B 2 Skills development in ICT

B 2.1 How do you rate your skills development in ICT at the following levels in you academic career? Use a scale where 1 = Poor; 2 = Fair; 3 =Good; 4 = Very Good; 5 = Excellent

B2.2	Ordinary level	1	2	3	4	5
B2.3	Advanced level	1	2	3	4	5
B2.4	Tertiary Level	1	2	3	4	5

B2.5 How are skills in ICT acquired in your institution?.....

……

……

B3 Administrative support

The University/College supports lecturers in ICT training with relevant and enough resources. Please rate how administrators help lecturers in ICT training under the following aspects of support using a scale where 1= Strongly disagree; 2 = Disagree; 3=Not sure; 4= Agree; 5= Strongly agree.

B3.1	Financial support	1	2	3	4	5
B3.2	Technical support	1	2	3	4	5
B3.3	Managerial support	1	2	3	4	5

B3.4 In summary, comment on the administrative support given to lecturers by your institution in ICT training

……

……

Section C: DEPENDENT VARIABLE: ICT IMPLEMENTATION

Please rate how often lecturers use a given ICT facility in teaching using a scale where 1 = Very rarely; 2 = Rarely; 3 = Regularly; 4 = Very regularly.

C1 Computer hardware and peripherals:

C1.1	Desk top computers	1	2	3	4
C1.2	Projectors	1	2	3	4
C1.3	Printers	1	2	3	4
C1.4	Scanners	1	2	3	4
C1.5	White boards	1	2	3	4

C2 Computer software

C2.1	Word processing	1	2	3	4
C2.2	Spread sheets (e.g. Excel, Lotus)	1	2	3	4
C2.3	Data base management (e.g. Ms-access, dbase	1	2	3	4
C2.4	Power Point	1	2	3	4
C2.5	Accounting software (e.g. Pastel, tally, Quick books)	1	2	3	4

C2.6 List any other software which lecturers use at your institution.

.....

.....

C3 Internet:

Please rate how often you use a given internet facility, using a scale where 1 = Very rarely; 2 = Rarely; 3 = Regularly; 4 = Very regularly.

C3.1	E-mail (sending and receiving messages)	1	2	3	4
C3.2	Electronic learning	1	2	3	4
C3.3	Electronic journals (in library)	1	2	3	4

C3.4 Specify any other internet facility(s) you are familiar with……...

APPENDIX D

INTERVIEW GUIDE FOR ADMINISTRATORS IN SELECTED INSTITUTIONS OF HIGHER LEARNING IN KABALE DISTRICT ON PROBLEMS INFLUENCING ICT IMPLEMENTATION

Section A BACKGROUND VARIABLES

A1 Your gender.……

A2 Your age ……

A3 Your Title ……..

Section B: INDEPENDENT VARIABLE: PROBLEMS

B1 Cost of ICT training materials:

B1.1 What costs are involved in ICT training materials in your institution?

……

……

……

B1.2 How costly you do find ICT training materials in your institution?

.....

B1.3 Is the cost of ICT training materials a barrier to teach using computers?

.....

B2 Skills development in ICT:

B2.1 Do all lecturers have ICT skills? ……...

B2.1 Is there a system for helping lecturers identify their training needs? ……

B2.2 Is there a programme relating to development of ICT use which incorporates pedagogical and subject specific issues? …….

B3 Administrative support:

B3.1 In what ways does your institution support lecturers in ICT training?

……

……

……

……

Section C: DEPENDENT VARIABLE: ICT IMPLEMENTATION

C1 Computer hardware and peripherals:

C1.1 Do all lecturers use computers in teaching?.....

C.1.1 What computer hardwares do lecturers normally use in teaching?

……

……

……

……

C2 Computer soft ware:

C2.1 What softwares do lecturers use in teaching?

……

……

C2.2 Do all subject areas have access to subject specific software? …….

C3 Communication facilities:

C3.1 Does the institution have any local area network? ……

C3.2 Is it accessible to lecturers and students? ……

C4 Internet:

C4.1 Does the institution have an internet facility in place? **.....**

C4.1 How is internet used by both lecturers and students?

……

……

……

……

APPENDIX E

OBSERVATION GUIDE ON VISIBLE ITEMS AND ACTIVITIES

Guiding items	Yes	N0
1. Are all computers connected to the internet?		
2. Are all computers properly working?		
3. Are computers enough?		
4. Are there computers placed in lecture rooms?		
5. Are there electronic white boards in lecture rooms?		
6. Are there overhead projectors used in teaching?		
7. Are there ICT policies in place?		
8. Are there ICT training schedules specifically for lecturers?		
9. Are computers accessible to all lecturers?		
10. Is there a budget on ICT training?		
11. Do all institutions have a staff development policy?		

APPENDIX F

DOCUMENTARY REVIEW GUIDE

	Observed	
Guiding items	**Yes**	**N0**
1. Documents on staff development policy		
2. Documents on training schedules		
3. Documents showing ICT training budgets		
4. Documents showing number of ICT training participants		
5. Document on ICT policy		

APPENDIX G

COMPUTATIONS FOR CONTENT VALIDITY INDEX

Content Validity Index = Total number of items rated as valid

Total number of items on the instrument

Content validity index computations

	Students	Lecturers	Administrators
Number of items rated valid	**23**	**25**	**15**
Total number of items on the instrument	**30**	**31**	**18**

CVI for students CVI for Lecturers CVI for administrators

$^{23}/_{30}$ **= 0.741935 = 0.74** $^{25}/_{31}$ **= 0.78125 = 0.78** $^{15}/_{18}$ **= 0.833333 = 0.83**

Average CVI = (074 + 0.78 +0.83) = 2.36 = 0.79

3 3

Since Computed CVI is above 0.70, the items on the instruments were considered valid

APPENDIX H

MAKERERE UNIVERSITY
P.O. Box 7062 Kampala Uganda
E-mail: deaneduc@educ.mak.ac.ug
Tel: +256-414-540733
Cables: "MAKUNIKA"

DEAN'S OFFICE
SCHOOL OF EDUCATION

Date _____

TO WHOM IT MAY CONCERN

Mr/~~Mrs/Ms/Sr/Rev/Fr~~ TWINOMUJUNI JUSTUS ARIHO

Is our M.A. (Education Policy and Planning)/M A (Ed.Mgt.)/M.Sc. (HRM)/ M.Ed.(ICT) Degree Student who is collecting data for his/her Dissertation titled: TRAINING AND ICT IMPLEMENTATION IN INSTITUTIONS OF HIGHER LEARNING IN KABALE DISTRICT.

We shall be grateful if you could render assistance to him/her in collecting the necessary data for his/her Dissertation.

Thank you in advance for your assistance.

Assoc. Prof. C.M. Ssebbunga
Dean, School of Education

MAKERERE UNIVERSITY
SCHOOL OF EDUCATION
13 MAR 2009
DEAN'S OFFICE