INFORMATION AND COMMUNICATION TECHNOLOGY USE IN INSTRUCTIONAL MANAGEMENT IN PRIMARY TEACHERS' COLLEGES IN NORTHERN UGANDA

OKETTA GEORGE
REG: 2010/U/HD/047/MEPPM

A RESEARCH DISSERTATION SUBMITTED TO THE SCHOOL OF POST GRADUATE STUDIES EDUCATIONAL PLANNING AND MANAGEMENT IN PARTIAL
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF EDUCATIONAL POLICY PLANNING AND MANAGEMENT OF KYAMBOGO UNIVERSITY

NOVEMBER 2013

DECLARATION

I, Oketta George, declare that the work presented in this book is my own and has never been submitted elsewhere for any award.

Signed..... Date..21st Nov, 2013

Oketta George

APPROVAL

This is to certify that this study has been carried out under our supervision and has been submitted with our approval as partial fulfillment for the award of the degree of Master of Educational Policy Planning and Management of Kyambogo University.

Signature ..... Date 21/11/2013

Dr. Aron Y. Otto

Signature ..... Date 22nd NOV 2013

Mr. Auma Okumu. S. S.

DEDICATION

To my family for contributing towards my academic life and success.

ACKNOWLEDGMENT

The production of this work has been a result of many hands. In particular, I wish to extend my heartfelt gratitude to Dr. Aron Y. Otto and Mr. Auma Okumu. S. S. for the guidance, constructive comments, support and tolerance during the writing of this dissertation. They read and reviewed my work and ably directed me with love and encouragement. I am indeed grateful to them.

I would like to deeply thank all my lecturers at Kyambogo University. They have adequately guided and equipped me with both theoretical and practical skills. I thank them for their dedication and inspiration.

I would also like to acknowledge the contribution of the course participants, from whom I enjoyed fruitful discussions on challenging topics.

Special thanks go to all respondents that I came into contact with during this study. Your generosity in accepting to participate in the study is acknowledged and highly appreciated.

Lastly, special thanks go to my dear wife Rose Mary for all the encouragement, counsel, understanding, prayer, support and for managing to withstand all the family responsibilities and keeping our dear children healthy and disciplined.

MAY GOD BLESS YOU ALL

TABLE OF CONTENTS

DECLARATION ..... **i**

APPROVAL ..... **ii**

DEDICATION ..... **iii**

ACKNOWLEDGMENT ..... **iv**

TABLE OF CONTENTS ..... **v**

LIST OF TABLES ..... **ix**

LIST OF FIGURES ..... **xi**

ABBREVIATIONS ..... **xii**

ABSTRACT ..... **xiii**

CHAPTER ONE **1**

INTRODUCTION **1**

1.1 Introduction 1

1.2 Background to the Study 1

1.3 Statement of the Problem 9

1.4 Purpose of study 10

1.5 Objectives of the study 10

1.6 Research Question 10

1.7 Significance of the Study 11

1.8 Limitations of the Study 12

1.9 Conceptual framework 12

1.10 Scope of Study 13

1.10.1 Geographical scope 13

1.10.2 Content scope 13

1.10.3 Time scope 14

CHAPTER TWO **15**

REVIEW OF RELATED LITERATURE **15**

2.1 Introduction 15

2.2 ICT Resources in the PTCs 15

2.3 Use of ICT in the Instructional Management 18

2.4 Student Teachers' Perception on the Use of ICT by their Tutors in Instructional Management 22

2.5 How to Improve on the Access and Use of ICT in Instructional Management 28

2.6 Summary of Literature 29

CHAPTER THREE **31**

RESEARCH METHODOLOGY **31**

3.1 Introduction 31

3.2 Research Design 31

3.3 Study Area 32

3.4 Population, Sample Size and Sampling Techniques 32

3.5 Instruments 34

3.5.1 Questionnaire 34

3.5.2 Interview guide 35

3.6 Data Collection Procedure 35

3.7 Data Quality Control 36

3.7.1 Validity of research instruments 36

3.7.2 Reliability of research instruments 36

3.8 Ethical Consideration 37

3.9 Data Analysis Method 37

3.9.1 Quantitative data analysis 37

3.9.2 Qualitative data analysis 37

CHAPTER FOUR 39

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS 39

4.0 Introduction 39

- Background Information 39
- ICT Resources in the PTC in Northern Uganda 45
- Extent to which ICT was used in Instructional Management by Tutors in the PTCs in Northern Uganda 49
- Student Teachers' Perception on the Use of ICT by their Tutors in Instructional Management 52
- Recommendations for Improving Access and Use of ICT in Instructional Management 59

CHAPTER FIVE 61

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS 61

5.0 Introduction 61

5.1 Discussion 61

5.1.1 ICT Resources in the PTC in Northern Uganda 61

5.1.2 Extent to which ICT was used in Instructional Management by Tutors in the PTCs in Northern Uganda 62

5.1.3 Student Teachers' Perception on the Use of ICT by their Tutors in Instructional Management 64

5.2 Conclusions 69

5.3 Recommendations 69

REFERENCES 71

APPENDICES 77

Questionnaire for the tutors in PTCs 77

Students questionnaires 81

Interview guide for key informants 87

Letter of Introduction 88

LIST OF TABLES

Table 3.1: Summary of population target 32

Table 3.2: Summary of sample target 34

Table 4.1: Type of College 39

Table 4.2: Gender of respondents 40

Table 4.3: Age range of respondents 41

Table 4.4: Level of education attained 42

Table 4.5: Subject of specialization 42

Table 4.6: Teaching experience as tutor 43

Table 4.7: Training in the use of computer 43

Table 4.8: Functional computer laboratory at college 44

Table 4.9: Year of study of students 44

Table 4.10: Results about availability of various types of ICT in the colleges from pupils, tutors and Principals 45

Table 4.11: Results about functional ICT at PTCs from pupils, tutors and Principals 48

Table 4.12: Time spent using ICT in a week at work place 49

Table 4.13: Results about whether tutors were making use of ICT in the teaching and learning activities 50

Table 4.14: Results about subjects taught using ICT resources 50

Table 4.15: Results about how interesting students found lessons taught involving ICT resources 51

Table 4.16: Results about purpose for which tutors use ICT at the college 52

Table 4.17: Results about reasons for using ICT in instructional management by tutors 53

Table 4.18: Results about obstacles/challenges in accessing and using ICT in instructional management by tutors 56

Table 4.19: Results about recommendations for improving access and use of ICT in instructional management 59

LIST OF FIGURES

Figure 1: Factors associated with ICT use in instructional management 13

ABBREVIATIONS

Connect-ED	: Connectivity for Educator Development
EDDI	: Education for Development and Democracy
ICT	: Information and Communication Technology
PTCs	: Primary Teachers' Colleges
US	: United States
USAID	: United States Agency for International Development

ABSTRACT

The purpose of the study was to find out the extent to which ICT is used by tutors in instructional management in the Primary Teachers' Colleges in Northern Uganda. The following were the objectives: to identify the major ICT resources that exists in the PTC, establish the extent to which ICT is used in instructional management by tutors in the PTCs, establish the student teachers perception on the use of ICT by their tutors in instructional management and suggest recommendations to improve access and use of ICT in instructional management. A cross-sectional survey study design was adopted. Both quantitative and qualitative methods were used. The study used 142 participants. Descriptive statistics were used to determine the distribution of respondents on personal information and on the questions for each of the variables. Qualitative data from interviews was reviewed, sorted and classified into themes and categories, in order to support the quantitative data. Findings revealed a very low availability of ICT resources in PTCs in Northern Uganda. The time spent using ICT in a week at work place in PTCs in Northern Uganda was very low. Tutors used ICT mainly to foster student ability to use ICT in learning, surf for information, access internet, make scheme of work, prepare lessons and for personal learning. Using ICT mainly increased students' motivation, made lesson more interesting, tutors more informed, rendered teaching easier and improved presentation of materials. The study further revealed that in Northern Uganda, PTCs encountered a lot of problems in utilizing ICTs in teaching and learning. This study found out the major obstacles and challenges that affected the use of ICT in teaching and learning in PTCs in Northern Uganda. These were ICT room, which accommodated very few students, inadequate computers, power failure, lack of interest in using ICT, hardware and software problems disrupting the lesson and tutors lack of knowledge and skills. The major conclusions of the study were that: ICTs were mainly used in teaching general knowledge in the PTC, ICT use was constrained by many challenges like electricity supply and the level of tutors' own education, literacy rates and access to professional development. The study recommends addressing the challenges of infrastructure, connectivity and pedagogical integration of ICT into the curriculum of PTCs including institutional issues of availability, access and use of facilities and develops capacity especially of the leaders to guide the integration of ICT in education.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study established the extent of information and communication technology (ICT) use in instructional management in the core and non-core primary teachers' colleges in northern Uganda. The core primary teachers' colleges in Uganda had the pre-service section and the out-reach arm. The out-reach arm provided in-service training program for teachers in the field where they are exposed to the rapid changes in technology and science and to innovations in curricula and teaching methods. Some of these teachers were qualified while others were recruited as licensed teachers and trained to become qualified grade III teachers. These teachers studied while at work. The non-core PTCs were pre-service colleges, which trained fresh student teachers who had got no teaching experience and were fulltime students. The chapter presents the background to the study, problem statement, purpose of the study, objectives of the study, research questions, scope of the study and conceptual framework to guide the research study.

1.2 Background to the Study

In this study, the independent variable was Information and Communication Technology (ICT) use while the dependent variable was instructional management. ICT is an umbrella term that includes all technologies for the communication of information (Brock, 2000). an umbrella word for any kind of device, system and other applications which can be used to process, transmit, store, retrieve, print, view, display or receive information from a source for social, economic, environmental, legal, education and political interactions, (Okaka, 2011). For the purpose of this study, ICT was used to refer to any technology in PTCs, which are primarily designated for student use. Surry and Ely (2001) define implementation (equivalent

to the term "use") as the process of introducing an innovation into an organization and fostering its utilization. In an information technology context, use encompasses all the processes involved in getting new software or hardware operating properly in its environment and making necessary changes.

Instructional management is a process which enables the tutor to achieve his/her stated instructional objectives and the student to learn. According to Tosti and Ball, (1969), instructional management are events and procedures involved in the decision to initiate a specific activity for an individual student. In view of this, instructional management tasks involve planning, organizing, decision-making, interpreting, communicating, coordinating, motivating, budgeting, evaluating and reporting. To accomplish these tasks, the tutor must work with and through the college administrators, students, support staff, colleagues and technology to achieve the instructional objectives of the lesson.

This study viewed ICT use in instructional management 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, compatibility, complexity, observability and trialibility.

Rogers (2003) 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 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). 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 PTCs tutors face the new demands placed on them, they will adopt ICT. If PTCs tutors see that ICT has value in their instruction, then they will use it (Sahin, 2006). To use ICT successfully in instructional management and in the training of student teachers in the PTC, tutors 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) 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) 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 PTCs tutors 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), "trialability is the degree to which an innovation may be experimented within 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) 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 tutors' likelihood of adopting a new technology into their teaching. Using Rogers' theory, Kim, (2009) 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 ICT resources and other ICT barriers/challenges as possible problems influencing ICT use in instructional management in PTCs in Northern Uganda.

ICTs have become common place entities in all aspects of life, for example in education, medical and personal use like mobile phone and iPod. Collis, (2000) noted that the last twenty years, the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavors within business, governance, and education. The use of ICT in instructional management depends on the application of technology as a tool which involves the use of a large array of hardware and software: word processors, graphic packaging applications, database and spreadsheet, and excel. Their application enhance effective involvement in research by tutors and students, presentation, record keeping, typing, printing, communication, documentation, storing and retrieving of information. Abimbade, (2008) in onasanya S.A, e tal, (2010) reported the benefits of ICT to tutors in the areas of teaching as: enhance the speed of availability of data and information, provide immediate feedback, increase tutors efficiency and effectiveness. He also explained further; that one needs to effectively use them in teaching. Information Communication Technology is a vital tool in instructional management when used appropriately plays various roles in teaching and learning processes in the colleges. Bransford et al, (2000) concluded that ICT has great

potential to enhance student achievement and teacher learning and teaching efficiency. Wong et al, (2006) also points out that technology can play a part in face-to-face teaching and learning in the classroom. They help students to be knowledgeable, reduce the amount of direct instruction given to them, and give teachers opportunities to help those students with particular learning needs. This facilitates transfer of skills also to student teachers.

In the process of instructional management, ICT has begun to have a presence in many places of learning and training in Uganda, but the impact has not been as extensive as in other fields such as banking, business and telecommunication. Moreover, Instruction Management in Universities and Colleges is a very pronounced activity and has traditionally been associated with strong teachers having high degree of personal contact with learners. Collis, (2002) noted that, in the process of instructional management, the instructor needs to be aware of the cross cutting issues that may seem to benefit all categories of learners. For instructions to be regarded as something of value, the internal and external factors of the individual learners need to be considered. Such factors include motivation, behavior change, skills and condition under which learning takes place, for instance formal type of learning for distance learning.

The use of ICT in the instructional management in teaching and learning is important for such learning conditions, like in distance education, through e-learning, teleconferencing facilities, the teacher can communicate to his/her learners through internet; exams for PTCs can also be released through internet available at Kyambogo University. The use of ICT resources in the instructional management lends itself to more student-centered learning settings and it often creates some tension for some teachers and students due to inadequate skills and knowledge. Collis, (2002) observed that, with the world of digital media and

information, the role of ICT in the instructional management should be raised by both the Tutors and the students. The effective use of ICT can lead to benefits in term of: greater motivation; increased self esteem and confidence; enhanced questioning skills; promoting initiative and independent learning; improving presentation; developing problem solving capabilities; promoting better information handling skills; increasing time 'on task', increasing social and communication skills; it enhances and adds a new dimension to learning process, increases communication between the tutor and student. Therefore, the tutor is able to provide administrators and parents with data relating to attainment, attendance or other instructional related information, research, and keeping record of work.

However, in an attempt to do so, Pierson, (2005) revealed that, much as ICT resources are very useful in the instructional management, there are barriers and obstacles to the access and use of various ICT techniques. He cited the following: access, time, support, resources and training, attitudes, beliefs, practices and resistance. Further studies conducted by Al-Alwani, (2005) showed that the extrinsic obstacles were more of organizational make than the individuals, while the intrinsic obstacles were pertaining to individuals like teachers, administrators and students. Ertmer, (1999) referred to extrinsic barriers as first order and cited access, time, support, resources and training and intrinsic as second order and attributed it to individual. Barriers such as, the inability by institutions to purchase ICT resources like computers, the type of Curriculum that has to be implemented and lack of training of tutors are extrinsic barriers because it originates from the organization whereas, poor attitude towards ICT by both tutors and students is intrinsic oriented since it comes from the individuals.

Dawes, (2001) explicitly showed that the lack of tutors' confidence in the use of ICT resources was a very big problem because failure by the tutor in managing any teaching resource meant failure of learning process by the learners. Majority of tutors were reported to have had a lot of fear of failure leading to lack of confidence in the use of the available ICT recourses like simple computer. Many tutors were also found to be lacking ICT knowledge; this made them to consider themselves to be unskilled in the use of the resources. Dawes, (2001) further showed that such tutors with limited knowledge about ICT were afraid of entering the classroom with limited knowledge in the area of ICT with their students knowing that this was the case.

The Ministry of Education and Sports ICT Draft Policy, (2005) stated that there have been different initiatives of ICT in the education sector, which were operating at different levels of the education system in Uganda. Among such initiatives was Connectivity for Educator Development (Connect-ED) Project. The project was initiated in 2000 in response to the comprehensive reform in Uganda's primary education system which redirected the function of primary teachers' colleges mainly on "improving the quality and equity of education." The connect-ED project was supported by USAID in close co-operation with Uganda's Ministry of Education and Sports and within the framework of the US-Education for Development and Democracy Initiative (EDDI). Connect-ED is using technology to enable and enhance learning and teaching for primary Educators through the creation of multifaceted approaches to integrating media and computers in the PTC classrooms.

Connect-ED accomplished this by setting up Education Technology Centers in PTCs, thereby increasing access, availability, and provision of relevant and quality learning materials and support for tutors/teacher professional development. Connect-ED provided connectivity to

first four and another four bringing the number to eight (8) PTCs covering all the regions in Uganda. The outcome of the program later spread to other PTCs and as a result, all Colleges as matter of policy were to have ICT laboratory, have ICT infrastructure, student teachers to contribute some money as ICT functional fee, have qualified ICT instructor and also tutors to have access to ICT. This represented a massive investment to "kick start" the use of ICT in Colleges across the country. Under this policy and program, tutors are not only required to be proficient but also to be savvy in the use of ICT in classrooms. With such an increased emphasis on ICT and a large investment in its infrastructure, tutors are expected to be competent and effective in adopting it. However, with all these in place, the study was geared to establish the extent to which tutors used ICT in instructional management in the PTCs in Northern Uganda.

1.3 Statement of the Problem

Although MOES adopted the use of ICT in teacher education as a policy in 2003, its application in instruction management in PTCs is rather low. When the government adopted ICT in instruction management, it necessitated the training of tutors in all PTCs. In Northern Uganda, it has not been clear on the ground. This information is also supported by other scholars like Kisalama, (2009) who stated that ICT use in instructional management is still poor. Thus, what is not clear was the extent to which the tutors were using ICT in their instructional management in PTCs. This study had therefore to establish the extent to which the tutors were making use of ICT in their instructional management activities in PTCs with specific reference to Northern Uganda.

1.4 Purpose of study

The purpose of the study was to find out the extent to which ICT is used by tutors in instructional management in the Primary Teachers' Colleges in Northern Uganda.

1.5 Objectives of the study

The study was guided by the following objectives.

1. To identify the major ICT resources that exists in the PTC in Northern Uganda.
2. To establish the extent to which ICT is used in instructional management by tutors the PTCs in Northern Uganda.
3. To establish the student teachers perception on the use of ICT by their tutors in instructional management in Northern Uganda.
4. To suggest way of improving access and use of ICT in instructional management in Northern Uganda.

1.6 Research Question

The study set out to answer the following research questions.

1. What are the major ICT resources that exist in the PTCs in Northern Uganda?
2. To what extent are tutors making use of ICT in instructional management in the PTCs in Northern Uganda?
3. What is the student teachers' perception on the use of ICT by their tutors in instructional management in Northern Uganda?
4. What suggestions can be made to improve use of ICT in instructional management in PTC in Northern Uganda?

1.7 Significance of the Study

The study might be of great importance to the following categories of people:

Administrators of PTCs would fully understand the use and roles of ICT in instructional management. Thus, they would devise ways of increasing the availability and use of ICT. They would also improve ICT facilities in their Colleges such as widening budget line to increase access and use of ICT in colleges. Because of this, the effect of ICT would trickle down to Primary schools.

The study would help the Ministry of Education and Sports to formulate relevant policies for effective provision of ICT facilities and design intervention strategies to promote the use of ICT in instructional management in the PTCs.

Student teachers would graduate with ICT skills in lesson preparation, storage and retrieval of information, and teaching. This would promote effectiveness and efficiency in instructional management activities in the primary schools in the country.

Tutors would be helped in the following ways. It would help them widen their existing ICT knowledge and skills. It would ease their work in lesson preparation, research for information, teaching, storage/record keeping, data analysis, retrieval of information and in correspondence with different stakeholders and would help them to carry out further research and improve their teaching effectiveness.

When the student teachers complete their studies, they would go out with the knowledge and skill in ICT to the field to begin formal teaching and therefore transfer the knowledge and skills to the primary schools.

1.8 Limitations of the Study

The study was of a national interest and concern; however, it had some limitations in term of:

Finance: because of limited fund, the study was confined to five PTCs in northern Uganda.

Time was not enough to carry out the study as the researcher had to balance time among work, study and family.

1.9 Conceptual framework

The framework below was considered to help conceptualize the purpose of this study (the extent to which ICT is used in instructional management by Tutors).

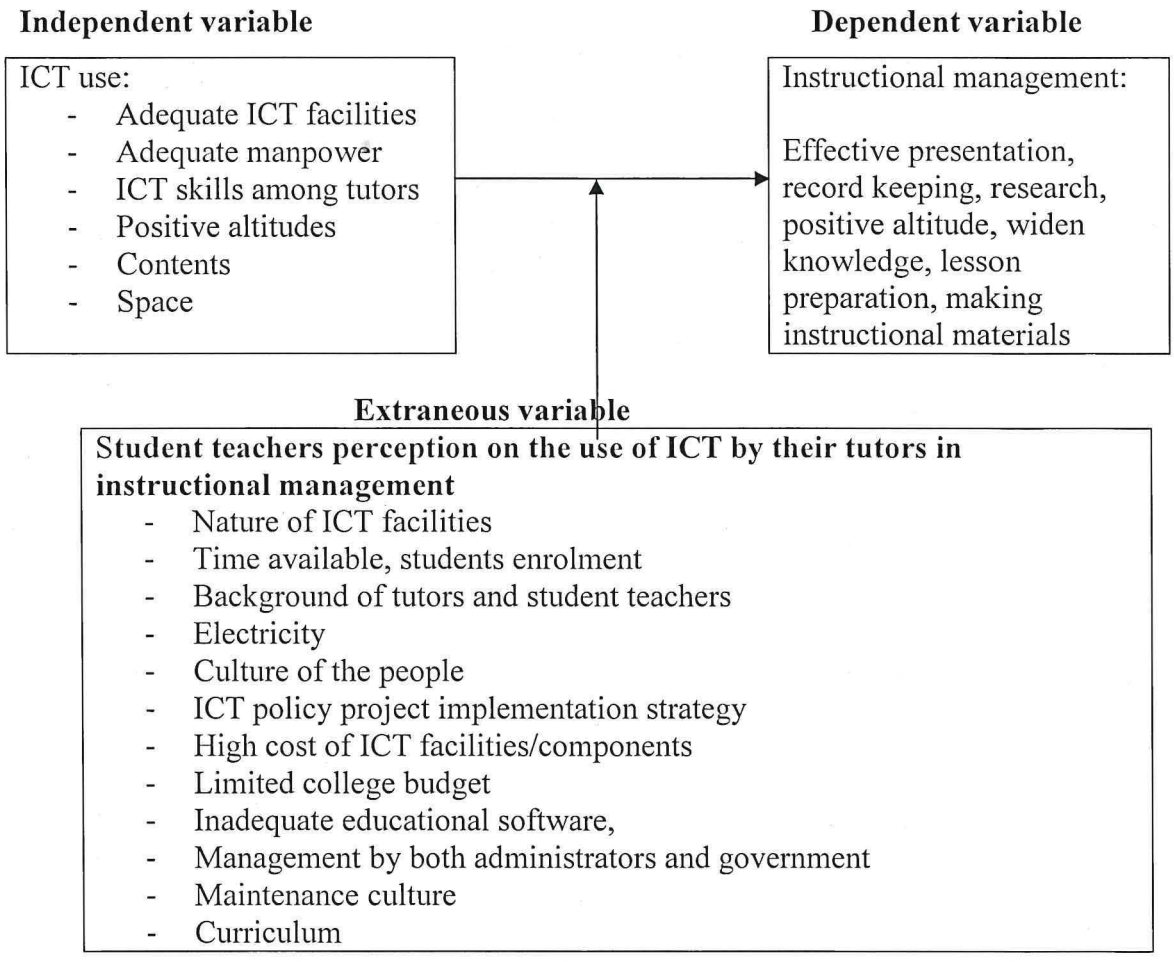


Figure 1: Factors associated with ICT use in instructional management (source: Oketta George, 2013)

The researcher believed that the ICT use presented a more; organized, efficient, focused, knowledgeable, update and innovative tutor in the independent variables, ICT factors that promote its use by tutors and student teachers. If these are addressed together with other factors in the extraneous variables which affect ICT use, then instructional management would be improved as indicated in the dependent variables. This is because the extraneous variable reinforces the independent variable in order to affect the results in the dependent variable. In this study extraneous variable was captured in objective three. A good interplay between ICT use and instructional management yields into effective ICT use in instructional management in the PTCs in Northern Uganda. The use of ICT in Colleges during instruction cannot be assumed to be complete without both the tutors and students getting involved directly or indirectly. This is because each party has a role to play in its use.

1.10 Scope of Study

1.10.1 Geographical scope

The study was conducted in PTCs in Northern Uganda. Northern Uganda is bordered by western Uganda, Central Uganda and Eastern Uganda. Northern Uganda was selected for this study because instructional management in PTCs had not improved despite the introduction of ICTs.

1.10.2 Content scope

The study focused on ICT use and instructional management. ICTs use was restricted to adequate ICT facilities, adequate manpower, ICT skills among tutors, positive altitudes, ICT contents and space. Instructional management was restricted to effective presentation, record

keeping, research, positive attitude, widen knowledge, lesson preparation, making instructional materials.

1.10.3 Time scope

The study commenced in October 2012 and was presumed to end by August 2013. Hence , the time scope was ten months

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This study established the extent to which information and communication technology (ICT) use in instructional management in the core and non-core primary teachers' colleges in northern Uganda. Core PTCs are training institutions used by government to train teachers. However, government has come up with a policy to bring innovation in teacher education by equipping the teaching learning facilities like motor cycles to support them in monitoring the in-service programs while the non-core is a PTC that has been in existence and is not well equipped as compared to the core PTCs.

This chapter presents the related literature of the study. It tries to point out what other researchers have done that is in line with the study at hand. It is the basis upon which research gaps are identified and research studies designed. The study was concerned with the use of Information and Communication Technology (ICT) in instructional management in the Primary Teachers' Colleges (PTCs) in Northern Uganda. The review of related literature centers on the identified objectives, research questions and areas that are relevant to the study. Therefore, the driving force behind the study was to establish whether the tutors were making use of ICT in instructional management specifically in PTCs in Northern Uganda.

2.2 ICT Resources in the PTCs

Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and handheld technologies have been used in teaching and learning situations. Similarly, new uses of technology are

constantly emerging, (Marshal, 2002). To Marshal, various technologies deliver different kinds of content and serve different purposes during instruction. Word processing and e-mail promote communication skills; database and spreadsheet programmes promote organizational skills; and modeling software promotes the understanding of science and mathematics concepts. It is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for education, (Tella., et al, 2010).

Technologies available in classrooms today range from simple tool-based applications (such as word processors), to online repositories of scientific data. Others are primary historical documents, handheld computers, closed-circuit television channels, and two-way distance learning classrooms. Prensky, (2005) asserts that even the cell phones that many now carry with them can be used to learn. According to Lei and Zhao, (2006) each technology is likely to play a different role in students learning. There, it should be noted that every technology has advantages and disadvantages when using.

According to Murphy et al, (2001), the primary form of student learning from computers is described as Discrete Educational Software (DES), Integrated learning system (ILS), Computer-assisted Instruction (CAI), and Computer-based instruction (CBI).These software applications are also the most widely available applications of educational technology in schools today, along with word-processing software, and have assisted in classroom for more than 20 years (Becker, Ravity & Wong, 1999). Murphy et al, (2001) explains that teachers use DES not only to supplement instruction, as in the past, but to introduce topics, provide means for self study, and offer opportunities to learn concepts otherwise inaccessible to students.

In view of the above, some educationists categorized the concept of educational technology in the form of hardware and software approach. Sampath et al, (2003) reported that the hardware approach is based on the application of engineering principles for developing electro-mechanical equipment for instructional purposes. These include motion pictures, tape recorders, data projector/Beamer, television, teaching machines, and computers. The software approach uses the principles of psychology for building in the learner a complex repertory of knowledge and modifying his/her behaviors. The programs which such a technology produces, are often called ''software''. It is characterized by task analysis, writing precise objectives, selection of appropriate learning strategies, immediate reinforcement responses and constant evaluation. All the above as shown have a lot to do with ICT and instructional management. Spuzic, (2006) reported that ICT resources such as television, radio, photocopier, scanners, printer, LCD projector, computer and others should be available in the institution to support the learning process. The researcher's view is there a various ICT resources that can be used in PTCs in northern Uganda as shown in the previous and present paragraphs. However, before the study was conducted, it was not known what kind of ICTs were in the region and whether there were adequate. This study sought to fill this gap.

Ndaloh, (2009) stated that ICT resources should not be viewed as additional devices to be used if time allows or be introduced just to occupy spare time or for the fun of it or even as teaching aids. They occupy an integral place in the instructional process and should thus be selected, prepared and used carefully in order to give the learners maximum benefit. He identify ICT resources like computer, projector, camera, television set, radio set, printer, scanner, telephones, and others. He adds that necessary computer programs and accessories be available for use by both tutors/teacher and students. According to Blurton, (2007), Information and Communication Technologies (ICTs) are a diverse set of tools and resources

used to communicate, create, disseminates, stores, and manage Information. Those technologies include Computers, the internet, broadcasting technologies, (radios and televisions), and telephony. He noted that in many countries worldwide, such tools and resources are commonly used by classroom Practitioners during the instructional process. The question of interest in this study was whether PTCs in northern Uganda took time to select suitable ICTs including the necessary computer programs and accessories for their students. The study sought to fill this gap.

In Uganda, it is a government policy that ICT be in all Colleges and student teachers contribute some money as functional fee. This shows that every PTCs in Uganda and particular, those in Northern Uganda have ICT resources that are very vital in instructional management.

2.3 Use of ICT in the Instructional Management

According to Blurton, (2007) Information and Communication Technologies (ICTs) are a 'diverse set of tools and resources used to communicate, create, disseminates, stores, and manage Information. Those technologies include Computers, the internet, broadcasting technologies,(radios and televisions), and telephony. Blurton, (2007) further noted that in many countries worldwide, such tools and resources are commonly used by classroom Practitioners during the instructional process. However, while preparing to teach, with an aim of using ICT, it should be an ultimate reflection of the teacher's view of the type and quality of control necessary to achieve the desired outcome of instruction. In view of the above, Barbe, (2009) observed that the variable 'use' should pertinently be a technique that teachers should consider. Use of ICT as a technique in the instructional management requires teacher to bear in mind the following: The type of ICT available for use; The choice of ICT in

particular to be accessed and use; The people to apply the ICT; Time and place the ICT is to be accessed and used or when and where the ICT are to be accessed and used and the way the ICT is to be applied. The researcher agree with the author\s view that the ICTs and programs be applied should be in line with instructional objectives.

Barbe, (2009) noted that these are indicators of effective involvement of ICTs in a lesson, these include:

The type of ICT should be available and displayed in the classroom for the learners to continue reflecting on it; The need to show, express and exhibited behavior change as contributed by the type of ICT-can the learners apply it even when the tutor is not there?; the learners need to show a sense of ownership by protecting the ICT facilities since they have known its value. According to Barbe, (2009), if the above indicators are not evident in the learners, then the tutor should not claim having been effective in using ICT in the instructional management.

According to Lei and Zhao, (2006), the use of ICTs in the instructional process is increasing and dramatically growing in many Universities and Secondary Schools world-wide. Lectures and teachers who effectively use ICTs in the teaching and learning process have helped the students to achieve better compared to the type of teaching and learning where there a lot of verbal communication. This is because the use of ICT resource enhances the existing topic through some aspect of the lesson and tasks. Lei and Zhao, (2009) sighted examples like using an electronic whiteboard for presenting theory about a topic. The teacher plans to complement the lesson with an innovative presentation method to promote class discussion and the visualization of problems.

Davis, (2008) observed that the use of ICT resources is a complementary approach during instructional management. This is because it empowers the learners' learning by enabling them to improve upon their class work by taking notes on the computer, or by sending homework by e-mail to the teacher, or by word processing their homework. Davis, (2008) further noted that the use of ICTs is an integral approach in the instructional management. Using ICT resource within the subject enhances particular concepts and skills and improves upon students' attainment. Davis, (2008) noted that teachers, who need to achieve the integral approach while using ICT resources, need to be careful and should consider the review of the curriculum area and select appropriate ICT resource which contributes to the aims and objectives of the curriculum.

In view of the above approaches, the use of ICTs should be greatly considered by all classroom practitioners at all levels. The instructional management in tertiary institutions like Primary Teachers' Colleges, the use of ICT should be part and parcel of the system. Olakulehin, (2007) noted that the pedagogy through the application of information and communication technologies while dealing with teachers to be has very many advantages. This ranges from motivation, helping recall previous learning, providing new instructional stimuli, activating learners' responses, providing systematic and steady feedback, facilitating appropriate practice, and sequencing learning appropriately, and providing a viable source of information to enhance learning. Tutors who use this system of instructional strategy are able to kindle in the heart of the student-teachers a desirable attitude towards information technology tools in their way of teaching the young ones in the primary schools.

However, the use of ICTs in Primary Teachers' College may vary due to a number of factors. Ramboll, (2006) noted that the differences with use of ICTs among institutions might be due

the following factors: Inadequacy of different ICT resources, management of the ICT resources that may be available, attitudes by both the tutors and student-teachers, and the tutors' competence in applying the ICT resource in the instructional management. Kirschner, (2003) noted that in colleges where there are enough ICT resources like computers, student-teachers have a wide range of opportunities in using them. However, in Colleges where computers are inadequate, chances for student-teachers to access them become very minimal. This disadvantages the student- teachers in a way that they cannot fully develop the skills and knowledge of working with a computer. This in turn may make the students and tutors to develop negative attitudes towards the use of ICTs like computers in their course of study. Kirschner, (2003) further noted that inadequacy of ICT resources in colleges, and lack of competences by the tutor denies the students chances of application and growth of e-learning opportunities for knowledge attainment. It is therefore important that college administrators consider ways of availing adequate ICT resources and to ensure that the tutors get the basic training and acquire knowledge in the handling and using the different ICTs in their instructional management activities,

In the Uganda education system, particularly in PTCs it is a government policy that ICT be in all colleges but students only contributes some money as functional fees. This has enabled all colleges to have ICT laboratories, with hardware, soft ware and network. It is also by government policy that each college should have an ICT Instructor who is well trained in ICT skills. The tutors also received training in ICT usage organized by the Ministry of Education and Sports. The college curriculum across the Country has adopted ICT as one of the areas to be taught to the student, this is why ICT is now timetabled like any other subject. This is an evidence/ indicator that there is some use of ICT in the instructional management in colleges.

2.4 Student Teachers' Perception on the Use of ICT by their Tutors in Instructional Management

According to Gray, (2003), the learner should be involved in the lesson at all stages. This enhances the development of different ideas and concepts and will be a means to an end. During the instructional management process, and with the use of ICT resources, the learner needs to be active participant other than being passive. The use of ICT resources that may make the learners to be active has a lot to do with the selection of the appropriate type(s) which gives meaning and help the learners to achieve the planned instructional objectives.

Stephenson, (2001) observed that there is great impact of ICT on what is learnt when the students are involved. Involving students in the use of ICT resources, firstly makes the teaching and learning process move away from the conventional teaching that emphases content. The teacher who applies conventional approach of teaching may be in the class with content at times in his/her head, or uses the textbooks to instruct learners on what to do. The classroom atmosphere is normally characterized by a lot of talking by the teacher through lecturing, making learners passive. However, with the use of participatory approach while using ICT resources, learners may acquire a lot through interpersonal exchange of ideas, which makes learning meaningful. He noted that with the use of ICT resources like computers, involving learners to directly operate the gadgets may enable them access a variety of information sources, and the learning becomes student-centered based and actively engaged in knowledge seeking, creation and sharing of what has been found.. This gives the learners opportunity to develop personal discoveries, and in turn make inquiries from the teacher. This type of teaching makes the teacher to be facilitators and mentors rather than contents experts.

McCausland, (2009) observed that the use of ICT in the instructional management goes in the 'heart' of information literacy. This therefore means that students connect information literate with the use of internet without having regular practice. Since ICTs are dominating so much in the contemporary life of work, and are now un-avoidable in the assessment and evaluation of learning outcomes. Learners need a lot of involvement during the instructional management. He further noted that involving students in the use of ICTs during instruction would have a great impact in their everyday life. This is because the use of ICTs as tools of every life has been seen as a pool of generic skills that have expanded in the recent years worldwide. All is on information literacy, and it is highly probable the future development and technology applications will see this set of skills growing even more.

When the students are directly involved in the use of ICTs during instruction, chances of positive influence and support to what is being learned become higher McCausland, (2009).Personal involvement in touching, opening and operating ICT resources like computers, will develop capacity to promote and encourage the transformation of education from a very teacher directed enterprise to one which supports more of student-centred models. McCausland, (2009) noted that this can be manifested in proliferation of capabilities, and competences by the individual learners, which make him/her move toward self problem-based learning.

Stephenson, (2001) noted that the use of ICT in educational settings, and with the involvement of learners, acts as a catalyst for change in both affective and cognitive domains. This is because ICTs is by their nature are tools that will encourage and support independent learning. Students, who use ICTs for purposes of learning, tend to become immersed in the learning and are as more and better informed in all principles and guide lines of using quite a

number of ICT resources. Stephenson, (2001) further observed that when students are involved in the use of ICT resources like computers and internet services, the concept of flexibility in the delivery and search of educational opportunities could be widened in a sense that learning can take place any time. Through internet services, students can enroll for external courses on other institutions, other than those situated locally. However, in concert with geographical flexibility, ICT resources can remove constraints that a learner with special needs face.

Young, (2002) observed that when students are directly involved in the use of ICT resources, learning becomes an activity that is no longer set within programmed schedules and slots. Learners are free to participate in learning activities when time permits and these freedoms can greatly increase the opportunities for many students to participate in formal programs with ease.

Young, (2002) further noted that with the mobile technologies, teachers can take advantage in a way that they support the students in learning through communication and collaboration with them and also among learners. Little can be seen as being so without learners getting involved in the use of ICT resources as a means making them develop techniques, skills and concretize their knowledge in various ICTs. In the modern world, many institutions like universities and colleges, the issue of involving learners and teachers in the use of ICTs in their teaching and learning process should therefore be regarded a matter of no choice. However, there is need to find out the perception of the student teachers in the use of ICT by their tutors in the instructional management in the PTCs in Northern Uganda. In general, student teachers broadly agree that the use of ICTs makes them more effective in their learning, more organized in their work and able to meet the varying needs of learning.

Studies conducted by Pierson, (2005) on the use of ICT tertiary institutions, revealed that much as ICT recourses are very useful in the instructional management, there are barriers and obstacles to the access and use of various types in the country. The study also revealed that the obstacles are classified into extrinsic and intrinsic barriers. Pierson, (2005) went further to report that the intrinsic barriers were seen as first- order, and sited the following: access, time, support, recourses and training. The intrinsic barriers were regarded as second-order and these include attitudes, beliefs, practices and resistance. Further studies conducted by Al-Alwani, (2005) showed that the extrinsic obstacles were more of organizational (institution) make that the individuals, while the intrinsic obstacles were pertaining to the individuals (teachers, administrators and students).

According to Becta, (2006) there were two categories of obstacles that hindered access and the use of ICTs in the school. These were at the teacher-level and at school-level. The obstacles at the teacher-level were cited as lack of time, lack of confidence and resistance to change. The obstacles at the school-level were cited as lack of effective training in solving technical problems and lack of access to recourses. However, Dawes, (2001) had explicitly showed that the lack of teachers' confidence in the use of ICT recourses was a very big problem because failure by the teacher in managing any teaching recourses meant failure of learning process by the learners. Most teachers were reported to have had a lot of fear of failure leading to lack of confidence in using of the available ICT recourses like simple computer. Many teachers were also found to be lacking ICT knowledge; this made them to consider themselves to be unskilled in the using of the recourses. Dawes, (2001) further showed that such teachers with limited knowledge about ICT were afraid of entering the classroom with limited knowledge in the area of ICT with their students knowing that this

was the case. Guided by literature in this paragraph, the study sought to find out whether in PTCs in northern Uganda, the problems associated with ICTs were also falling at the teacher-level and at school-level or not.

Becta, (2006) pointed out that lack of teachers competence was yet a big obstacle in the use of ICT in the instructional management. Teachers who are incompetent were found to be lacking the knowledge and skills of integrating ICT into the pedagogical practices in the classroom. With this type of incompetence, teachers could not apply the rightful knowledge and skills in the use of computers and other ICT devices this could the case today in some primary teachers' colleges where the tutors are not enthusiastic about the need for ICT in the teaching. It therefore became difficult for them to interpret and support the learning process with various recourses. Related to the teachers' competences is the issue of resistance to change and negative attitude.

Becta, (2006) showed that for any information in the education sector to take route, both the user (beneficiaries) and the implementers need to have positive attitude towards it and are ready to change. The resistance to change can be a very outstanding g barrier to teachers' of the new technologies in education. Studies conducted by Becta, (2006) revealed that the science teachers had a bigger resistance to change concerning the use of the new ICT strategies. This was because most teachers of science claimed to be well informed and showed no reason for integrating use of ICT resources like radios and telephones in their teaching such a state of affairs tended to be a very big obstacle in the use of ICT during instructional management. This is because teachers' beliefs influence what learners do in class. However, Earle, (2002) pointed out that resistance to change may not be a barrier, but instead it is an indication that something is probably wrong.

In view of the above, it may be observed that probably some teachers seem to see no value in using computers in their areas of specialization. Although the content may not really call for advancement of that kind-the teaching and learning, this can be seen as successful without any ICT resource. It can also be associated with environmental factors which seem to be unmanageable (Earle, 2002).

This is because change from a present level to a desired level of performance (the use of ICT), may be facilitated by deriving/encouraging forces such as the power of new development, rapid availability of resources, creativity , internet access and ease of communication. Many of the primary teachers' colleges in our country Uganda may be victims of the circumstances. This is because of the fact that many may not have adequate computers and internet services. The lack of the adequate resources in the attempt to having an innovation expected to take route makes the users and the implementers to have very little desire about the change (Earle, 2002).

AL-Awani, (2005) noted that teachers in the system may have competences and confidence in using ICT resources like computers but they still make little use of technologies because they do not have enough time. Al-Alwani et al, (2005) identified time limitations and the difficult in the scheduling enough computer time for classes as the barrier to teachers' use of ICT in the teaching. Most teachers lack time to plan for technology lessons, they cannot explore the different internet sites, and working for aspects of educational software appears cumbersome to them. Becta, (2006) found out that the problem of lack of time exists for teachers in many aspects in their work as it affects their ability to complete tasks with some of the participant teachers specifically stating the aspect of ICT, requires more time. Such

arrangement needed enough time to locate internet advice, to prepare, explore and practice using the technology, deal with technical problems and receive adequate training. This kind of situation could be the case in some primary teachers colleges, particularly in the Northern part of Uganda where in the recent years Kony war impacted negatively to many facilities in schools.

Al- Alwani, (2005) showed that the issue of obstacles to the use of ICT in instructional management was yet a desire of study. This is because a wide range of factors still stand and this include: lack of computers, lack of quality software, lack of time, technical problems, teachers' attitudes towards computers, poor funding, lack of teachers' confidence, resistance to computers, poor administrative support, lack of computer skills, poor fitting with the curriculum, lack of incentives, scheduling difficulties, poor teaching opportunities and lack of skills in how to integrate ICT in education.

2.5 How to Improve on the Access and Use of ICT in Instructional Management

Al- Alwani, (2006) discussed various strategies on how access and use of ICTs in the instructional management could be improved. Firstly, the removal of the barriers by resolving and reducing the reasons for the occurrence of these barriers would in making sure that educators teachers, Principals need to collaborate to overcome any of the obstacles and break down the above mentioned barriers to a meaningful integration of ICT into the instructional management. AI-Alwani et al, (2006) noted that instructions need to ensure that ICT facilities are in place, the teachers need to demand for internet access, local area networks and wireless internet. With such in place, students might have opportunities to explore information besides books and course ware. With regard to above, Primary Teachers' Colleges (PTCs) need therefore to consider and avail adequate access, practice and use the devices effectively. Al-Awani et al, (2006) further noted that for institution to do well in terms of ICTs in the

instructional management there is a great need to have a centralized database, or a ICT network for the teachers to facilitate sharing of different materials. This will enable them to post very important information to students and other institutions, plan for events, and above all be able to process a variety of assessment results for the students.

However, as earlier noted by Becta, (2006) that lack of time and technical support, limited the use and integration of ICT in teaching, this can be worked upon by ensuring that the staff gets adequate training. This will enable them acquire technical knowledge and skills in the areas of ICT recourses. When teachers have adequate skills in any instructional materials, chances of influencing the learners become high (Becta, 2006). In related strategies, Becta, (2006) further observed that schools needed to be arranged and school- based professional development of ICT conferences. With this in place, the teachers would have opportunities to access various ICT facilities, and this would be a basis upon which they would improve upon their skills.

From the researcher's view, a number of strategies have been highlighted in this paragraph. However, whether none or few or all these strategies could be adopted by PTCs in northern Uganda was not known before conducting the study. This is because it was believed in this study that strategies may not be generic but might need to be tailed in the context of an institution.

2.6 Summary of Literature

The review of literature focused on the objectives of the study. First, various ICT resources from video content and digital moviemaking to laptop computing and handheld technologies that can be used to support and enhance learning were reviewed and literature emphasized that different technologies deliver different kinds of content and serve different purposes in the classroom. Thus, it was important to establish whether PTCs in Northern Uganda used a

variety of ICT resources because this would determine the extent they influenced instruction management. Literature also highlighted the utilization of ICTs in instruction management. It was revealed that ICTs could be used to communicate, create, disseminates, stores, and manages Information during instruction management. It was emphasized that effective utilization of ICTs in instruction management depended on teachers' competence, teachers and students' attitudes towards the ICTs, the type of ICT available for use, the choice of ICT, the people to apply the ICT, time and place the ICT is used or when and where the ICT are used and the way the ICT is to be applied. Literature on student teachers' perception on the use of ICT by their tutors was also reviewed. Literature highlighted whether student teachers were actively or passively involved in the use of ICTs in instructional management. Lastly, literature on how to improve use of ICTs in instruction management was reviewed and various recommendations were emphasized. However, issues in the literature were not in the context of PTCs in Northern Uganda and thus they was need to conduct this study to find out if what the literature said was applicable to use ICTs in instruction management in Northern Uganda.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This study established the extent to which information and communication technology (ICT) use in instructional management in the core and non-core primary teachers' colleges in northern Uganda. This chapter dealt with the methods that the researcher used in handling the data. It is divided into the following sub-sections: research design, study area, subjects, sampling techniques, instruments for collecting data, data collection procedures, data control, data analysis and ethical considerations.

3.2 Research Design

A cross-sectional survey study design was adopted in this study. This is because Amin, (2005) recommends that a cross-sectional survey design helps the researcher obtain information from respondents at one point in time without the need to follow up the respondents and thus save on time used to collect data. Both quantitative and qualitative methods were used. The qualitative approach was mainly used to describe subjective assessments, analyses and interpretation of attitudes, opinions and behavior of the respondents as expressed in verbatim from opened-ended questions (Mugenda and Mugenda, (1999). The quantitative method helped in supplementing the qualitative approach as recommended by Mugenda and Mugenda, (1999). This was because there was need to outlay some information data obtained using close-ended questions statistically in order to bring out the statistical aspects of the study clearly. The quantitative approach involved the collective application of data in quantitative analysis and manipulation and were expressed in frequencies and percentages as Mugenda and Mugenda, (1999) suggest.

3.3 Study Area

The study was conducted in the PTCs located in Northern Uganda. This area comprised of five PTCs namely Gulu PTC, Loro PTC and Kitgum PTC, which were core PTCS and Canon Lawrence PTC and Christ the King PTC, which were non-core PTCs.

3.4 Population, Sample Size and Sampling Techniques

The subject, the study sought included three groups of participants at the college level. In each PTC, there was 1 Principal, 45 tutors and 90 students for core PTCs and 95 students for non-core PTCs. The following table shows that population.

Table 3.1: Summary of population target

Name of college	Type of college	Principals	Tutors	Student
Gulu PTC	Core	1	9	90
Loro PTC	Core	1	9	90
Canon Lawrence PTC	None core	1	9	95
Crist The King PTC	None core	1	9	95
Kitgum PTC	Core	1	9	90
Total		5	45	460

Thus, the total population was 510. The following provides the reasons for targeting the different groups of the population.

The Principals of selected PTCs: these were chosen by virtue of the head of the institutions and were expected to oversee and ensure that the teaching and learning went on well at all levels to meet the needs of the global world. Thus these were purposively selected. Purposive sampling was used to select principals because they had more knowledge about the ICTs and instructional management.

The tutors of selected PTCs: these were supposed to actively be involved in the actual implementation of the college curricular in their departments and discipline with a view of helping students to achieve their objectives in the learning process. Simple random sampling was used to select the tutors. Simple sampling was used to give an equal chance of tutors to be selected given that number was big and not all tutors were selected.

The student teachers of selected PTCs: both year one and two in the college. These were selected because they were the direct beneficiaries of the entire learning out comes in the college, which directly or indirectly addressed modern trends that required skills and knowledge of ICT. Simple random sampling was used to select the year 1 and 2 student-teachers. Simple random sampling was used to select the student-teachers. Simple sampling was used to give an equal chance of student-teachers to be selected given that number was big and not all student-teachers were selected.

One rule of thumb for determining an adequate sample size for descriptive research is that it should consist of 10 to 20% of the population under study (Gay, 2003). In this study, to maximize the sample size, a 20% was used. Thus, for each PTC, the participants of this study comprised of 1 Principals, 9 tutors, 18 students from core PTCs and 19 student teachers non-core PTCs in Northern Uganda. Both male and female tutors and student teacher were selected. The study used a total of 142 participants. The number of females were 43 as opposed to 49 males. This is because in the college, the population of female students is quite low.

Table 3.2: Summary of sample target

Name of college	Type of college	Principals	Tutors	Student
Gulu PTC	Core	1	9	18
Loro PTC	Core	1	9	18
Canon Lawrence PTC	None core	1	9	19
Crist The King PTC	None core	1	9	19
Kitgum PTC	Core	1	9	18
Total		5	45	92

3.5 Instruments

Questionnaire and Interviews were used by the researcher. These methods facilitated collection of variety of data from various sources from which the researcher derived data for the study.

3.5.1 Questionnaire

A questionnaire survey is a research instrument for collecting information from a selected group using standardized questions (Amin, 2005). Self-administered questionnaires (SAQs) were used to collect quantitative data from tutors and student-teachers. SAQs were used for this category of respondents to save on time because their number was big to interview. Each category of respondents had a different set. Questionnaires were chosen because they made data collection easy, since respondents could complete them with little or no supervision. The items were both close-ended and open-ended. The open-ended items served to get information in areas where the researcher was not acquainted with the alternatives available and in areas where opinions and feelings of the respondents were of need.

3.5.2 Interview guide

Face-to-face interviews were used to collect data from Principals as key informants because they enabled the researcher to establish rapport with these categories of respondents and therefore gain their cooperation. They also allowed the researcher to clarify ambiguous answers and obtain in-depth information through probing. Semi structured-interviews were designed to collect data for this study. Open-ended questions were used to capture other valuable questions that emerged from the dialogue between interviewer and interviewee. Semi-structured interviews are the most widely used interviewing formats for qualitative research (DiCicco-Bloom & Crabtree, 2006). In this study, the probing interviewing tactic was used extensively to obtain a deeper explanation of the issue at hand from the respondents. This was largely due to the fact that the respondents often needed stimuli to expand or clarify their own answers and ideas more broadly, so that a broader understanding was more easily reached later on in the findings of this study.

3.6 Data Collection Procedure

The researcher first made a familiarization tour in the colleges, to develop collegial relationships with the respondents, and also to deliver a letter of introduction from the Dean of the Graduate School, Kyambogo University. Arrangements were made to visit the individual colleges to administer the questionnaire. The researcher requested the Principals to help in organizing the student teachers and tutors. The researcher then presented a letter of consent to the respondents, after which, questionnaires were distributed with the help of research assistants. The research assistants further explained to the respondents the purpose of the study, how to fill the questionnaires and duration respondents were expected to complete the questionnaires. Each respondent was given at least one week to complete the questionnaires, which the research assistants collected for analysis. The researcher also

arranged to conduct the oral interviews for key respondents in the college. The researcher used a tape recorder and a note book to record and note information during the interviews.

3.7 Data Quality Control

3.7.1 Validity of research instruments

Validity refers to how well a test measures what it is purported to measure (Amin, 2005). A validity test was carried out prior to the administration of the research instruments. This was done in order to find out whether the questions were capable of capturing the intended data (Amin, 2005). Supervisors in research reviewed the questions to see whether they were capable of capturing the intended response. A Content Validity Index (CVI) was calculated in order to establish the validity of the research instrument. The researcher used the following formula to establish validity of the research instruments as seen below.

$$\text{Content validity Index (CVI)} = \frac{\text{Relevant items by all judges as suitable}}{\text{Total number of items judged.}}$$

The CVI was .792, which was greater than the recommended .70 by Amin, (2005). Thus, the questionnaire was valid for data collection.

3.7.2 Reliability of research instruments

Reliability is the degree to which an assessment tool produces stable and consistent results (Mugenda & Mugenda, 1999). Reliability of the questionnaire was assessed using Cronbach's coefficient alpha. The questionnaire was pre-tested to 20 respondents and the reliability results was computed using the SPSS package. The following formula was used to calculate the Cronbach's coefficient alpha

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum SDi^2}{\sum SDt^2}\right)$$

Where α = coefficient alpha

$\sum SDi^2$ = sum variance of items

$\sum SDt^2$ = sum variance of scale

The alpha coefficient was .82, which was above the recommended .70 stated by Amin, (2005). Thus, the questionnaire was suitable for data collection.

3.8 Ethical Consideration

In order to reduce respondents' suspicions and gain confidence to participate in the study, the researcher assured the participants that the study was purely academic and meant for the improvement of the College curriculum in various disciplines. The information given therein therefore would have no intentions of malice or sabotage of any kind. The researcher also sought consent from selected respondents. Both male and female student teachers participated in the study to balance the gender bias.

3.9 Data Analysis Method

3.9.1 Quantitative data analysis

Coded (quantitative) data was entered in a computer program known as a Special Package for Social Scientists (SPSS) for analysis. Descriptive statistics were used to determine the distribution of respondents on personal information and on the questions under each of the variables. The data was organized and presented in tables using frequencies and percentages.

3.9.2 Qualitative data analysis

For qualitative data from interviews, it was reviewed thoroughly, sorted and classified into themes and categories, in order to support the quantitative data. This involved content analysis, which was used to edit qualitative data and reorganize it into meaningful shorter sentences. A thematic approach was used to analyze qualitative data where themes, categories and patterns were identified. The recurrent themes, which emerged in relation to each guiding

question from the interviews, were presented in the results, with selected direct quotations from participants presented as illustrations.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction

This study established the extent of information and communication technology (ICT) use in instructional management in the core and non-core primary teachers' colleges in northern Uganda. This chapter presents, analyzes and interprets the results. It was divided into five major sections. The first section presents results on students and tutors' background information. The second section presents results on major ICT resources that exists in the PTC in Northern Uganda. The third section presents results on the extent to which ICT was used in instructional management by tutors in the PTCs in Northern Uganda. The fourth section presents results on tutor trainees' perception on the use of ICT by their tutors in instructional management. The fifth section presents results on recommendations to improve access and use of ICT in instructional management.

- **Background Information**

Background information focused on type of college, gender, age range, highest level of education attained, subject(s) of specialization, tenure as a tutor, training in the use of computer, sponsorship in the training, functional computer laboratory at college. The following sub sections present the results.

Table 4.1: Type of College

On tutors, they were asked about the type of college. The table that follows presents the results.

Type of college	Frequency	Percent
Core PTCs	27	60.0
Non core PTCs	18	40.0
Total	45	100.0

The results in Table 4.1 show that majority of tutors (60%) responded that their colleges were core while 40% said that it were non-core. The implication of this result was that most PTCs in Northern Uganda fall in the core PTC category. In this study, it was believed that this was due to Ministry policy and probably due to lack of funding.

Table 4.2: Gender of respondents

Tutors and students were asked about their gender. The following table presents the results.

Gender	Respondents		Total
	Tutor	Student	
Male	24 (53%)	49 (53%)	73 (53%)
Female	21 (47%)	43 (47%)	64 (47%)
Total	45 (100%)	92 (100%)	137 (100%)

Table 4.2 shows that majority of tutors and students (53%) were male as compared to the female tutors and students (47%), respectively. This was because male tutors and students dominate PTCs in Northern Uganda. Thus, any study conducted was more likely to constitute more male tutors and students as compared to the female tutors and students.

Table 4.3: Age range of respondents

Tutors and students were asked about their age range. The following table presents the results.

Age range	Respondents		Total
	Tutor	Student	
30-33 yrs	7 (16%)	0 (0%)	7 (5%)
34-37 yrs	11 (24%)	0 (0%)	11 (8%)
38-41 yrs	17 (38%)	0 (0%)	17 (12%)
42 and above yrs	10 (22%)	0 (0%)	10 (7%)
17-19 Yrs	0 (0%)	16 (17%)	16 (12%)
20-22 Yrs	0 (0%)	70 (76%)	70 (51%)
Above 23 Yrs	0 (0%)	6 (7%)	6 (4%)
Total	45 (100%)	92 (100%)	137 (100%)

The results in Table 4.3 show that majority of tutors (38%) were aged between 38-41 years, followed by tutors aged 42 years and above (22%). These constitute 60% of the tutors that participated in the study. On the other hand, majority students (76%) were aged between 20-22 years, followed by students aged between 17-19 years (17%). These constitute 93% of the students that participated in the study. These results imply that majority of tutors in PTC in Northern Uganda were aged 38 years and above while the rest students were aged between 17-22 years.

Table 4.4: Level of education attained

Tutors were asked about their highest level of education attained. The following table presents the results.

Highest level of education attained	Frequency	Percent
Diploma	5	11.1
First degree	40	88.9
Total	45	100.0

The results in Table 4.4 show that majority of tutors (88.9%) responded that their highest level of education attained was a first degree while 11.1% responded that they attained diploma level. The implication of the results was that majority of tutors in PTCs in Northern Uganda had a first degree level of education.

Table 4.5: Subject of specialization

Tutors were asked about their subject of specialization. The table that follows presents the results

Subject of specialization	Responses	
	Frequency	Percent
Language	22	25.3%
Social studies	15	17.2%
Math	15	17.2%
Science	8	9.2%
Religious studies	5	5.7%
Professional education	7	8.0%
SST	1	1.1%
Music	5	5.7%
Physical education	6	6.9%
Art	3	3.4%
Total	87	100.0%

The results in Table 4.5 show that majority of tutors (25.3%) responded that their subject of specialization was language while 17.2% said that it was social studies and math, respectively

and 9.2% said it was science. The implication of the results was that majority of tutors in PTCs in Northern Uganda specialized in language, social studies, math and science.

Table 4.6: Teaching experience as tutor

Tutors were asked about their tenure as tutor. The following table presents the results.

Tenure	Frequency	Percent
1-5 yrs	2	4.4
6-10 yrs	5	11.1
11-15 yrs	33	73.3
16+ yrs	5	11.1
Total	45	100.0

The results in Table 4.6 show that majority of tutors (73.3%) responded that they had been tutors for a period of 11-15 years while 11.1% showed that they had been tutors for a period of 6-10 years and the rest 16 years and above. The implication of the results was that majority of tutors in PTCs in Northern Uganda they had been tutors for a period of 11 years and above.

Table 4.7: Training in the use of computer

Tutors were asked about training in the use of computer. The following table presents the results

Training in the use of computer	Frequency	Valid Percent
Yes	8	17.8
No	37	82.2
Total	45	100.0

The results in Table 4.7 show that majority of tutors (82.2%) said that they had never been trained in the use of computer while 17.8% responded that they had been trained in the use of computer. The implication was that majority of tutors in PTCs in Northern Uganda had never

been trained in the use of computer. When tutors who responded that they had been trained in using computers were asked who sponsored the training, all responded that it was self-sponsorship.

Table 4.8: Functional computer laboratory at college

Principals, tutors and students were asked whether the college had a function computer laboratory. The following table presents the results.

College has a functional computer laboratory	Respondents			Total
	Tutor	Student	Principal	
Yes	45 (100%)	92 (100%)	5 (100%)	142 (100%)
No	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	0 (100%)	0 (100%)	0 (100%)	0 (100%)

The results in Table 4.8 show that all Principals (100%), tutors (100%) and students (100%) responded that the college had a functional computer laboratory. The implication of the results was that all PTCs in Northern Uganda had functional computer laboratory.

Table 4.9: Year of study of students

Students were asked about their year of study. The following table presents the results.

Year of study	Frequency	Valid Percent
Years 1	39	42.4
Years 2	53	57.6
Total	92	100.0

The results in Table 4.9 show that majority students (57.6%) responded that their year of study was year 2 while 42.4% said that it was year 1. The implication of the results was that both students of year 1 and 2 participated in the study.

- **ICT Resources in the PTC in Northern Uganda**

Table 4.10: Results about availability of various types of ICT in the colleges from pupils, tutors and Principals

Principals, tutors and students were asked about availability of various types of ICT. The following table presents the results.

Availability of type of ICT	Respondents			Total
	Tutor	Student	Principal	
Computers	45 (100%)	92 (100%)	5 (100%)	142 (100%)
LCD projector /Beamer	0 (0%)	0 (0%)	1 (20%)	1 (1%)
IPod	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Digital camera	5 (11%)	2 (2%)	5 (100%)	12 (8%)
Internet	43 (96%)	91 (99%)	5 (100%)	139 (98%)
Digital Television	18 (40%)	34 (37%)	0 (0%)	52 (37%)
Digital radio	0 (0%)	1 (1%)	0 (0%)	1 (1%)
E-mail for the College	0 (0%)	0 (0%)	5 (100%)	5 (4%)
Video Camera	18 (40%)	37 (40%)	0 (0%)	55 (39%)
Scanner	18 (40%)	38 (41%)	1 (20%)	57 (40%)
Printers	14 (31%)	23 (25%)	5 (100%)	42 (30%)
Photocopiers	43 (96%)	92 (100%)	5 (100%)	140 (99%)
Smart board	1 (2%)	0 (0%)	0 (0%)	1 (1%)
Stencil cutter	42 (93%)	92 (100%)	5 (100%)	139 (98%)
Ipad	1 (2%)	1 (1%)	0 (0%)	2 (1%)

The results in Table 4.10 show the following as the major available ICTs in PTCs in Northern Uganda. Computers as indicated by all tutors, (100%), all students (100%) and all Principals (100%). Internet as indicated by majority of tutors (96%), majority of students (99%) and all Principals (100%). Photocopiers as indicated by majority of tutors (96%), all students (100%) and all Principals (100%). Stencil cutter as indicated by majority of tutors (93%), all students (100%), and all Principals (100%). Thus, these results suggest that computers, internet, photocopiers and stencil cutter were available to the Principals, tutors and students.

The following ICTs are available to particular categories in PTCs in Northern Uganda. Digital camera as indicated by 11% of tutors, 2% of students and all Principals (100%), digital television as indicated by 40% of tutors and 37% of students but no Principal (0%) indicated as such, video camera as indicated by 40% of tutors and 40% of students but no Principal (0%) indicated as such. These results suggest that digital cameras are available to only Principals given that few tutors and students mentioned them while digital television and video cameras were only available to tutors and students in the as no Principal was aware of their existence at the institutions. Other ICTs that are available to particular categories in PTC are scanner as indicated by 40% of tutors and 41% of students and 20% of Principals and printers as indicated by 31% of tutors, 25% of students and all Principals (100%). Note that most Principals indicated these ICTs as available. The implication was that scanners are available to few Principals, tutors and students while printers are only available to the Principals. ICTs that are not available include LCD projector /Beamer, iPod, digital radio, e-mail, smart board and ipad. These was because none or very few of the Principals, tutors and students responded that there were available at the PTCs.

Interview results concurred with results obtained using questionnaire. For example, when asked about ICT resources available in PTCs, it was established that ICT in the PTCs was still not the norm due to a number of logistical and developmental challenges. During interview, most of the key informants reported that computers, photocopiers, stencil cutters and internet were the most ICTs at the PTCs. In total PTCs had 11 to 40 computers and 0 to 2 other types of ITCS. During the field, it was observed that only three out the five PTCs had a variety of ICTs. However, almost half the number of ICTs in these PTCs were functional.

Table 4.11: Results about functional ICT at PTCs from pupils, tutors and Principals

Principals, tutors and students were asked about the functionality of various types of ICT. This was because ICTs may be available but not functional in such a situation, the ICT can be regarded as not available. The following table presents the results.

	Functional	Sometimes functional	Rarely functional	Not at all functional
Computers	8 (6%)	132 (93%)	0 (0%)	2 (1%)
LCD projector /Beamer	1 (1%)	0 (0%)	0 (0%)	0 (0%)
Digital camera	5 (4%)	2 (1%)	5 (4%)	0 (0%)
Internet	10 (7%)	113 (80%)	1 (1%)	15 (11%)
Digital Television	0 (0%)	47 (33%)	1 (1%)	4 (3%)
E-mail for the College	5 (4%)	0 (0%)	0 (0%)	0 (0%)
Digital radio	1 (1%)	0 (0%)	0 (0%)	0 (0%)
Video Camera	0 (0%)	46 (32%)	1 (1%)	8 (6%)
Scanner	1 (1%)	51 (36%)	2 (1%)	3 (2%)
Printers	5 (4%)	31 (22%)	1 (1%)	5 (4%)
Photocopiers	120 (85%)	11 (8%)	0 (0%)	9 (6%)
Smart board	0 (0%)	0 (0%)	0 (0%)	1 (1%)
Stencil cutters	101 (71%)	8 (6%)	0 (0%)	30 (21%)
Ipad	0 (0%)	0 (0%)	0 (0%)	2 (1%)

The results from Table 4.11 show that ICTs, which were functional in PTCs in Northern Uganda, were photocopiers as indicated by 85% of the Principals, tutors and students and stencil cutters as indicated by 71% of the Principals, tutors and students. ICTs that were

sometimes functional in PTCs in Northern Uganda are computers as indicated by 93% of the Principals, tutors and students, and internet as indicated by 79% of the Principals, tutors and students. Note that other ICTs were not available in the PTCs in Northern Uganda thus the issue about their functionality was not applicable to them.

- **Extent to which ICT was used in Instructional Management by Tutors in the PTCs in Northern Uganda**

Table 4.12: Time spent using ICT in a week at work place

Tutors were asked about time spent using ICT in a week at work place. The following table presents the results.

Time spent using ICT in a week at work place	Frequency	Valid Percent
0-2 hrs	36	80.0
3-5 hrs	8	17.8
9-11 hrs	1	2.2
Total	45	100.0

The results in Table 4.12 show that majority of tutors (80%) responded that time spent using ICT in a week at work place was 0-2 hours. Less than a fifth of the tutors (17.8%) said it was 3-5 hours while very few tutors (2.2%) said it was 9-11 hours. Thus, these results reveal that time spent using ICT in a week at work place was very little. Hence, the extent to which ICT was used in instructional management by tutors in the PTCs in Northern Uganda was very low.

Table 4.13: Results about whether tutors were making use of ICT in the teaching and learning activities

Students were asked whether tutors making use of ICT in the teaching and learning activities. The following table presents the results.

Tutors making use of ICT in the teaching and learning activities	Frequency	Percent
Yes	92	64.8
No	50	35.2
Total	142	100.0

Most students (64.8%) answered in affirmative while over a third of the students responded negatively. This shows that in PTCs in Northern Uganda, majority of tutors made use of ICT in the teaching and learning activities while few tutors did not. Thus, there was limited utilization of ICTs in the teaching and learning activities in PTCs in Northern Uganda.

Table 4.14: Results about subjects taught using ICT resources

Students were asked about subjects taught using ICT resources. The following table presents the results

Subjects taught using ICTs	Frequency of 92	Percent
General knowledge in all subjects	92	100.0
Science	20	21.7

The results in Table 4.14 show that all the students (100%) responded that general knowledge in all subjects was taught using ICT resources while few students (21.7%) said that science was taught using ICT resources. These result, therefore, show that ICT resources in PTCs in Northern Uganda were mainly used in teaching general knowledge in all subjects. The implication of these results was that the extent to which ICT resources are used in teaching and learning subjects was very limited.

However, results from interviews were supportive of the students' responses. For example, was established during interviews that the subjects taught using ICT differed from institution to institution with some PTCs having the least subjects. In most PTCs the students were only introduced to computers in areas such as knowing the key components of the computer especially hard ware, typing skills, key board functions, games. Even when computers are available in some PTCs, computers are often only used for specific courses or by specific personnel, and many teachers, students, and subject-areas still lack access to ICT

Students were asked how interesting do they found lessons taught involving ICT resources. The following table presents the results.

Table 4.15: Results about how interesting students found lessons taught involving ICT resources

How interesting students found lessons taught involving ICT resources	Frequency	Percent
Very interesting	38	41
Interesting	53	58
Dull	1	1
Very dull	0	0
Total	92	100

It shown in Table 4.15 that over half of the students (58%) found lessons taught involving ICT resources interesting while approximately half of the students (41%) found them very interesting. These results reveal that most students in PTCs in Northern Uganda enjoyed lessons taught using ICT resources. Thus, if ICT resources are available and accessible, this implies they can be extensively utilized.

Principals and tutors were asked about the purpose for which tutors use ICT at the college. The following table presents the results.

Table 4.16: Results about purpose for which tutors use ICT at the college

Purpose for which tutors use ICT	Frequency of 50	Percent
Foster student ability to use ICT in learning	50	100
Surf for information	50	100
Personal learning	49	98
Access to internet	44	88
Make scheme of work	44	88
Prepare lessons	42	84
Analyze students' performance	21	42
Communication	20	40

The results in Table 4.16 show that all Principals and tutors (100%) responded that purpose for which tutors used ICT at the college was to foster student ability to use ICT in learning and surf for information. On the other hand, most Principals and tutors responded that purpose for which tutors used ICT at the college was accessing internet and making scheme of work as indicated by 88%, preparing lessons as indicated by 84% and for personal learning as indicated by 98%. The least purposes for which tutors used ICT at the college were analyzing students' performance and communication.

- **Student Teachers' Perception on the Use of ICT by their Tutors in Instructional Management**

Principals and tutors were asked about reasons for using ICT in instructional management by tutors in the PTCs in Northern Uganda. The following table presents the results.

Table 4.17: Results about reasons for using ICT in instructional management by tutors

Reasons for using ICT in instructional management by tutors	Frequency of 50	Percent
Using ICT increases students' motivation	40	80
Using ICT makes lesson more interesting	38	76
Using ICT makes tutors more informed	37	74
Using ICT makes teaching easier	34	68
Using ICT improves presentation of materials	30	60
Using ICT promotes individual learning	26	52
Using ICT makes learners discover their incompetence in using the technology	25	50
Using ICT makes lesson more fantastic	24	48
Using ICT makes student makes attentive during lessons	23	46
Using ICT gives me time to prepare my lesson effectively	21	42
Using ICT makes me more informed	20	40
Using ICT makes students learn at their own pace	18	36
Using ICT makes student read ahead	17	34
Using ICT makes lesson more diverse	13	26

The results in Table 4.17 show that most Principals and tutors responded that using ICT increased students' motivation as indicated by 80%, made lesson more interesting as indicated by 76%, made tutors more informed as indicated by 74%, made teaching easier as indicated by 68% and improved presentation of materials as indicated by 60%. Approximately half of the Principals and tutors responded that using ICT promoted individual learning, made learners discover their incompetence in the technology, made lesson more fantastic, make student attentive during lessons, gave tutors time to prepare their lesson effectively and made tutors more informed. Few Principals and tutors responded that using ICT made students learn at their own pace, made student read ahead and made lesson more diverse.

Interview results supported the results obtained using questionnaires and even explained more. For example, it was established during interviews that as far as lesson planning was concerned, reported impact was in the area of using the internet to update teaching content; regularly updating teaching notes using available templates and efficient and effective

utilization of time. Key informants stated that when lesson plans are developed by using ICT, it was easier to edit and update them through the available templates; prepare Power Point slides in preparation for teaching and the availability of internet makes the preparation much easier because students are referred to certain websites to do research and read ahead of the lesson. This saves a lot of time and energy on the part of the tutors compared to when it was done manually. One key informant noted, '*I do my lesson plan on the computer, save the notes on a flash disk and transfer to students flash disks' (Interview with a core PTC teacher, 4th July 2013)*. Key informants in institutions that had internet connection indicated that it helped tutors greatly to search for most recent information used to update their teaching notes especially in the absence of more recently published text books.

Within class teaching, the reported impact during interviews was on the level of confidence it gave to the students and tutors, the variety of interactive methods used and the richness of content taught. Key informants in institutions where ICT was integrated reported that ICT helps tutors in enriching teaching content that had been obtained from text books, improved their confidence as they were well informed and prepared and it facilitated more interaction and participation with the students as there was no constant reading or writing on the part of the tutors. Key informants stated that integrating ICT has a very big impact in improving tutors' teaching methods as using other methods like illustrations and demonstrations can effectively be employed in the process of teaching. For example, a tutor stated, "... *being a science tutor, some information was becoming obsolete, but with ICT one gets current information on any area of study and my students are happy with that*". She added that once she involves the audios and visuals in her science lesson, students were very much interested and their attention span was far more than when she doesn't integrate ICT in her subject. The key informants who reported that tutors had not felt the impact yet in this area was due to the

fact that they do not have the necessary ICT equipment and the computers were not in class and limited skills in ICT integration in their subjects.

It was established during interviews that ICT has been very important in the area of evaluation where tutors use in built systems to evaluate their learners. This was confirmed by a statement made by a key informant that,

> "*The use of ICT has helped us to evaluate student performance trends and therefore making it possible to tell whether the class performance is improving or declining. Consequently, we utilize such information to give guidance and counseling to learners*" (Interview with Principal, 6th July 2013).

Another key informant also mentioned, "*As an institution, it is easier to compute marks for example using excel data where teachers enter raw marks and they are computed. Personally, I keep all my records electronically, I only print when need arises*" (Interview with tutor, 9th July 2013).

The impact of ICT on learners and learning was reported during interviews and included the following; There has been increased access to qualitative educational materials especially through surfing. This access has resulted into improved content delivery on the part of the tutors and access to update educational information on the part of the learners. This makes learners' more enthusiastic to put in more effort and perform better.

Principals, tutors and students were asked about obstacles/challenges in accessing and using ICT in instructional management by tutors in the PTCs in Northern Uganda. The following table presents the results.

Table 4.18: Results about obstacles/challenges in accessing and using ICT in instructional management by tutors

Obstacles to access and use ICT in instructional management by tutors	Frequency of 142	Percent
ICT room accommodates very few students	134	94
Computers are not enough	126	89
Power failure	127	89
Lack of interest in using ICT	116	82
Hardware and software problems often disrupt the lesson	112	79
Lack of knowledge and skills	94	66
Using ICT in teaching is expensive	46	32
Curriculum does not require using ICT	43	30
Timetable is overloaded	40	28
ICT makes the lesson more difficult	31	22
Using ICT makes it more difficult to control the class	29	20
Congestion of the time table	27	19
ICT makes preparing the lesson more difficult	20	14
Using ICT makes class management more difficult	18	13
Using ICT reduces students' motivation	9	6
Using ICT makes tutors not to complete the syllabus	8	6
Using ICT impairs students' learning	7	5
Using ICT in teaching is not enjoyable	6	4

The results in Table 4.18 show that most Principals, tutors and students responded that obstacles/challenges in using ICT in teaching and learning were ICT room accommodating very few students as indicated by 94%, few computers and power failure as indicated by 89%, lack of interest in using ICT as indicated by 82%, hardware and software problems often disrupting the lesson as indicated by 79% and lack of knowledge and skills as indicated by 66%. Thus, these were the major obstacles/challenges in using ICT in teaching and learning in PTCs in Northern Uganda given that there were identified by of most the Principals, tutors and students. However, the study also established other obstacles/challenges considered minor in using ICT in teaching and learning in PTCs in Northern Uganda since there were identified by few Principals, tutors and students. For example, it was established that using ICT in teaching was expensive, curriculum did not require using ICT, timetable

was overloaded, ICT made the lesson and class control more difficult and congestion of the time table. Other minor obstacles/challenges were that ICT made lesson preparation and class management more difficult, reduced students' motivation, made tutors not to complete the syllabus, impairs students' learning and was not enjoyable.

Interview results shade more light on obstacles/challenges to accessing and utilizing ICTs in instructional management. Interviews revealed that while the ratio of students to computers was still very high especially in non-core PTCs on a positive note the studied PTCs were trying their best to provide the necessary ICT infrastructure. This has been through individual institution initiatives with very limited or no support at all from government. The following were the results from one of the interviews "*It is apparent that non-core PTCs have a higher student to computer ratio than core PTCs. This is because government and other funders are more willing to invest into the ICT in core PTCs than non-core PTCs (Interview with Principal, May 2nd 2013)*". High student to computer ratio poses a big challenge to the institutions if they were to realize their ICT pedagogical integration goals.

Interviews with Principals and those particularly in charge of computer labs revealed that access to the computer facilities within the institutions was through the set up labs which were time tabled for both computer classes and free computer lesson sessions for private access. The students always were aware of the timetable class sessions and free sessions for access to the computer labs. However, few of the computer labs were always open throughout the day and partly in the evening. The students obtained permission to access the computer labs through the ICT instructors who had the authority to accept or deny them access.

Interview results revealed that in all the PTCs, there were strict rules put in place with regard to student accessibility to the computer laboratories. In some of these institutions, students only accessed computers when they were attending computer lessons and generally had no time to practice what was learnt during their free time. The limited numbers of computers together with the restrictions based on the regulations were often cited by key informants during the interview as factors limiting access to computers. During interview, it was established that ICT instructors in some PTCs were not residing at the institution premises and therefore weekends could not be used for accessing the computer labs despite the students being free from class work.

Interviews revealed that internet Connectivity was found in only 2 out of 5 institutions studied and connected to just a few computers mainly because connectivity access rates were quite high. Interview results further revealed that the cost of internet connection and maintenance was a big challenge that the institutions managers mentioned. The low and absence of internet connection within PTCs in Northern Uganda was closely related to very high cost of the bandwidth in Uganda. Furthermore, it was revealed during interviews that the majority of tutors had not been adequately trained in pedagogical integration of ICT.

Results from interviews revealed that once students get addicted to digital they don't easily learn from other methods. Some of them have reached the extent of not taking notes or even attending classes. In some cases learners over rely on Internet; become stubborn in class even when they do not have the capacity to separate between relevant information and trash.

Some key informants complained that students had become lazy as they hoped to get all the formulas and information they wanted from the Internet. Therefore, ICT has on some

occasions, discouraged hard work and the spirit of innovativeness and makes students less functional in a situation where computers were not available.

- **Recommendations for Improving Access and Use of ICT in Instructional Management**

Principal, tutors and students were asked about recommendations for improving access and use of ICT in instructional management in the PTCs in Northern Uganda. The following table presents the results.

Table 4.19: Results about recommendations for improving access and use of ICT in instructional management

Obstacles to access and use ICT in instructional management by tutors	Frequency of 142	Percent
Sensitize the benefits of ICT	135	95
Equip ICT laboratory with ICT resources	123	87
Managing simple computer repairs	103	73
Encourage ICT workshops/seminars/competitions	89	63
Using ICT to enhance teaching	77	54
Develop policies to diffuse ICT in colleges	43	30
Using ICT to search for information	41	29
Examine ICT independently	37	26
Equip all departments with computers	35	25
Obtain lesson plan content/activities using ICT	27	19

Most Principals, tutors and students recommended sensitization of the benefits of ICT as indicated by 95%, equipping ICT laboratory with ICT resources as indicated by 87%, managing simple computer repairs as indicated by 73%, encouraging ICT workshops/ seminars/competitions as indicated by 63% and using ICT to enhance teaching as indicated by 54%. Other recommendations by few Principals, tutors and students included developing policies to diffuse ICT in colleges, using ICT to search for information, examining ICT

independently, equipping all departments with computers and obtaining lesson plan content/activities using ICT.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This study established the extent of information and communication technology (ICT) use in instructional management in the core and non-core primary teachers' colleges in northern Uganda. This chapter presents the discussion, conclusions and recommendations. It was divided into three major sections. The first section presents discussion while the second section presents the conclusions and the third section presents the recommendations.

5.1 Discussion

5.1.1 ICT Resources in the PTC in Northern Uganda

The first objective was to identify the major ICT resources that existed in the PTC in Northern Uganda. Findings revealed a very low availability of ICT resources in PTCs in Northern Uganda. It was established that the most available ICTs in PTCs in Northern Uganda were computers, internet, photocopiers and stencil cutter (see page 45 of chapter four). These were available to Principals, tutors and students. Digital cameras and printers were available to only Principals while digital television and video cameras were available to tutors and students and scanners were available to few Principals, tutors and students (see page 46 of chapter four). ICTs that were not available in PTCs in Northern Uganda included LCD projector/Beamer, iPod, digital radio, e-mail, smart board and ipad. Findings revealed that ICTs functional in PTCs in Northern Uganda were photocopiers and stencil cutters. ICTs that were sometimes functional in PTCs in Northern Uganda were computers and internet (see page 46 of chapter four).

These findings concur with Kaweesa, (2002) who observed that in Uganda, many sectors like in Education were still heavily relying on traditional systems and severely lagging behind as far as new technologies were concerned. The findings also support Farrell, (2007) who observed that the majority of the schools in East Africa were without internet. He argued that some schools have certain ICT resources but this could be limited to one computer in the office of the school head. Very few secondary schools have sufficient ICT tools for teaching and learning. Even in schools with computers, the student-computer ratio was high (Farrell, 2007). Farrell, (2007) further supports the findings of this study by observing that in Uganda, a number of schools have computers and internet access. The computers were normally set up in one-room laboratories with 10 to 20 machines. A television receiver with a VCR may be included depending on reception capability.

5.1.2 Extent to which ICT was used in Instructional Management by Tutors in the PTCs in Northern Uganda

The second objective was to establish the extent to which ICT was used in instructional management by tutors in the PTCs in Northern Uganda. Findings of this study revealed that time spent using ICT in a week at work place in PTCs in Northern Uganda was very little (see page 49 of chapter four). This was because majority of tutors in PTCs in Northern Uganda spent 0-2 hours using ICT in a week at work place while very few tutors spent more than 2 hours using ICT in a week at work place (see page 49 of chapter four). Hence, the extent to which ICT was used in instructional management by tutors in the PTCs in Northern Uganda was very low. This finding supports (Farrell, 2007) who argued that use of the ICT facilities in Uganda was scheduled two or three times per week per class.

This study established that in PTCs in Northern Uganda, majority of tutors made use of ICT in the teaching and learning activities while few tutors did not (see page 46 of chapter four).

Thus, there was limited utilization of ICTs in the teaching and learning activities in PTCs in Northern Uganda. However, ICT resources in PTCs in Northern Uganda were mainly used in teaching general knowledge in all subjects. Thus, the extent to which ICT resources were used in teaching subjects was very limited. Findings of this study support Trucano, (2005) who revealed that teachers most often use ICTs for 'routine tasks' (record keeping, lesson plan development, information presentation, basic information searches on the Internet). Teachers who use ICTs most effectively were less likely to use traditional 'transmission-method' pedagogies but tend to practice more "constructivist" pedagogies.

One major question that keeps on being asked was whether ICTs were essential in the process of improving the quality of teaching, or, in other words, if the introduction of ICTs to standard teaching contributes in itself to the improvement of the quality of teaching. Findings of this study showed that the purpose for which tutors used ICT in PTCs in Northern Uganda was mainly to foster student ability to use ICT in learning, surf for information, access internet, make scheme of work, prepare lessons and for personal learning (see page 52 of chapter four). The least purposes for which tutors used ICT in PTCs in Northern Uganda were analyzing students' performance and communication (see page 52 of chapter four). These findings of this study support Strudler, McKinney and Jones, (1995 as cited in Tabura & Bakkabulindi, 2008) who pointed out that the intention of adopting ICTs in schools should not just be for teachers to learn ICTs skills but that teachers need to explore ways of integrating these skills into their teaching for example when preparing schemes of work and in daily planning for their lessons. Findings of this study show that the main benefits of ICT-use for PTCs in Northern Uganda were not the direct outcome of the technology itself; rather this study shows that the use of ICTs challenges teachers to rethink their methods as well as delivery practices which can lead to improved delivery as well as teaching that was more

effective. Findings of this study support Tabura and Bakkabulindi, (2008) who observed that ICTs could be used to prepare lessons for students. The role of ICTs in enhancing teacher practices can be seen in the emergence of such technologies as computers.

Findings of this study were almost similar to a range of studies that have looked at why teachers choose to use ICT. For example, Tella, Toyobo, Adika and Adeyinka, (2007) examined Nigerian secondary school teachers' uses of ICTs and implications for further development of ICT use in schools using a census of 700 teachers. The findings showed that most teachers perceived ICT as very useful and as making teaching and learning easier. Research and active projects, such as those run by EdQual, a Research Consortium of educational institutions in the UK and Africa (Ghana, Rwanda, South Africa, Tanzania) on educational quality, typically indicate some main reasons why teachers use ICT. These include teachers feel learners benefit from using computers themselves; they gain confidence, self-esteem and renewed motivation. Haddad and Draxler, (2002) categorized the technology use in a classroom into five levels: presentation, demonstration, drill and practice, interaction and collaboration. Building on this, Thijs et al., (2001) argue that technology use creates a learner-centered environment by motivating learners by combining text, sound, color and moving images that enhance content for easier learning; facilitating acquisition of basic skills through drill and practice (not very learner-centered sounding though) and enhancing teacher training by improving access to and the quality of teacher training.

5.1.3 Student Teachers' Perception on the Use of ICT by their Tutors in Instructional Management

The third objective was to establish the student teachers' perception on the use of ICT by their tutors in instructional management. It was established in this study that using ICT in PTCs in Northern Uganda mainly increased students' motivation, made lesson more

interesting, made tutors more informed, made teaching easier and improved presentation of materials (see page 53 of chapter four). On the other hand, using ICT in PTCs in Northern Uganda fairly promoted individual learning, made learners discover their incompetence in the technology, made lesson more fantastic, make student makes attentive during lessons, gave tutors time to prepare their lesson effectively and made tutors more informed (see page 53 of chapter four). However, using ICT in PTCs in Northern Uganda to a small extent made students learn at their own pace, made student read ahead and lesson more diverse (see page 49 of chapter four).

Findings of this study concur with Higgins, (2004 as cited in Moya, Musumba & Akodo, 2011) who argued that it was a proven fact that ICT does improve the teaching and learning process, however, there was always problems when it comes to the acquisition of the necessary infrastructure from administrations who were the financial controllers and decision makers of any organization. This was because this study found out that PTCs in Northern Uganda encountered problems in utilizing ICTs in teaching and learning. This study established that major obstacles/challenges in using ICT in teaching and learning in PTCs in Northern Uganda were ICT room accommodating very few students, inadequate computers, power failure, lack of interest in using ICT, hardware and software problems disrupting the lesson and lack of knowledge and skills (see page 56 of chapter four). However, the study also established other obstacles/challenges considered minor in using ICT in teaching and learning in PTCs in Northern Uganda (see page 56-57 of chapter four). For example, it was established that using ICT in teaching was expensive, curriculum did not require using ICT, timetable was overloaded, ICT made the lesson and class control more difficult and congestion of the time table. Other minor obstacles/challenges were that ICT made lesson

preparation and class management more difficult, reduced students' motivation, made tutors not to complete the syllabus, impairs students' learning and was not enjoyable.

Physical access to ICT is the first step towards making technology accessible to the local people and yet PTCs in Northern Uganda do not have adequate ICT resources. This finding confirms Butcher, (2001) cited in Were et al., (2007) who emphasized that in Africa the ratio of people to ICT resources was very low.

Belshaw, (2006 as cited in Tabura & Bakkabulindi, 2008) supports this study's findings as he found out that some teachers failed using ICTs due to some major factors such as confidence, time, access to quality resources, and the expectation of faults occurring during teaching sessions. Similarly, Emans, (2004) supports this study's findings as pointed out that for many teachers and for many schools, the use of computers for educational purposes might be a threatening step because there was often little expertise, and teachers and school directors were reluctant to take the first step.

The findings of this study agree with Menda, (2006) and Janczewski, (1992) who were of the view that in most countries of Sub-Saharan Africa, inadequate technological infrastructure, such as lack of hardware and software, and internet, limit individual and community access to ICT and pose a barrier to its integration with the curriculum in schools. In addition, finding of this concur with Jensen, (2005) and Minishi-Majanja, (2007) who emphasized that to the commonly listed issues of infrastructure, the African region faces many external systemic factors such as electricity, technical faults and network configuration problems.

The problem of power failure to using ICTs in PTCs in Northern Uganda should not be a surprise to most people who has lived in East Africa and in Uganda in particular the rural Northern

Uganda. The available literature confirms the well-known fact that the East African countries face a shortage of electrical energy supply (Hennessy, 2010). In Tanzania, the national electricity grid was limited to commercially viable areas missing out most of the schools in the rural areas. This, together with frequent power breakdowns and power cuts, has increased the cost of owning ICT infrastructure (Farrel, 2007) and made it almost impossible for schools in the rural areas to access and use ICT in education. Kenya and Uganda too face similar electrification challenges. In these countries, hydro-power constitutes the bulk of energy supply. Other major sources of commercial energy include petroleum and biomass energy resource such as fuel-wood and charcoal, causing a sharp rise in deforestation in the region. Alternate sources such as wind and solar energy options have not been exploited to their full capacity (Hennessy, 2010).Erratic electricity supply with occasionally lengthy blackouts limits the use of ICT in schools (Hennessy, 2010).

Findings of this study related to high expenses associated with ICTs as a problem to in PTCs in Northen Uganda support Unwin, (2005) who observed that while educational software was increasingly being developed, such access to the internet was rare and expensive in Africa. He argued that Eastern Africa has no submarine connectivity at present. Two-way satellite connectivity is now widely available, but the costs of using this for educational purposes remain prohibitively high to be a sustainable choice for classroom use or for teacher education in the short- to medium-term (Unwin, 2005). Hence, use of ICT in education was hampered by the cost of bandwidth which was unaffordable for many schools. Many rural schools such as PTCs in Northern Uganda located outside the national telecommunications network have to use expensive satellite technologies.

Available technology needs to be affordable by PTCs if it was to be adopted. At the national level, affordability could be limited by the high cost of putting infrastructure in place, and was

linked with the issue of poverty (Hennessy, 2010). At the individual or organizational level, expensive hardware and software as well as high costs of communication and services restrict access to ICT (Hennessy, 2010). Most schools in Africa do not have the means to purchase expensive computers and hardware, and provide training for their staff (Hennessy, 2010). Minishi-Majanja, (2004) identifies financial sustainability as one of the major constraints for ICT use in schools.

Lack of interest as an obstacle/challenge in using ICT resources in PTCs in Northern Uganda concur with Chege, (2003 as cited in Tabura & Bakkabulindi, 2008) who cited lack of acceptance of ICT as an urgent national need as a reason for slow penetration of ICTs in the Africa. He argued that technology was still considered a luxury by many within the region and extreme poverty necessitates countries to choose between feeding the hungry and sheltering the homeless over investing in enhancing technological infrastructure and thereby improving access. Schools themselves were under-funded and have little resource to spend on technology (Chege, 2003 as cited in Tabura & Bakkabulindi, 2008).

Qualified teachers were often seen as a catalyst in the introduction and effective use of technology in schools (Hennessy, 2010). Unfortunately, in PTCs in Northern Uganda, the lack of trained tutors and the low levels of tutor's ICT knowledge and skills have been identified as major impediments to effectively utilization of ICT technology in PTCs. Teachers who do not have a chance to develop professionally in the use of emerging technologies and acquire modern computer literacy and skills were under threat. The relevance of a teacher was determined by the will to develop professionally and appropriately, while teacher development, according to MacDougall and Squires, (1997).

5.2 Conclusions

ICTs were mainly used in teaching general knowledge in PTCs in Northern Uganda but students were not taught how to use ICT as a tool to facilitate learning in other areas. It was shown that PTCs in Northern Uganda were yet to address the critical question of how ICT could be integrated into other subjects and generally be applied to improve teaching and learning processes.

PTCs in Northern Uganda faced several challenges, however, in the attempt to use ICT in education. Currently, the curriculum did not prioritize ICT. ICT use in PTCs in Northern Uganda was still constrained by irregular or unavailable electricity supply, inadequate ICT equipment leading to overcrowding of computer labs, insufficient ICT resources and software/hardware problems and the highly prohibitive costs of ICTs.

Some of the educational obstacles identified in this study factors included levels of teachers' own education and literacy rates and access to professional development play an important role. For example, some of the significant barriers identified were linked to staff attitude and training in the use of ICT, access and ICT skill in general. Specifically, attitudes of trainees and teacher trainers indicate a gross lack of independent learning skills and a reluctance to take responsibility for their own learning.

5.3 Recommendations

The study recommends the following:

1. Tutors in PTCs in Northern Uganda should be helped by PTCs to integrate ICTs use in teaching in all subjects instead of only general knowledge. This can be achieved through conducting ICT seminars and workshops for tutors to gain skills in using ICTs in various

subjects. PTCs with together with governments and NGOs could arrange for the seminars and workshops.

2. The Ministry of Education and Sports should address the challenges of infrastructure, connectivity and pedagogical integration of ICT into the curriculum of PTCs not only in Northern Uganda but also countrywide. PTCs in Northern Uganda should have to address institutional issues of access and use of facilities and develop capacity especially of the leaders to guide the integration of ICT in education. There is a need for a general paradigm shift from associating ICT with only computers and considering how other technologies should be integrated in education.

3. Tutors should be encouraged by the colleges to develop a positive attitude towards use of ICTs in instructional management. This can be achieved through arranging for them training in the use of ICT and ICT skill in general. This will help tutors acquire ICT skills and take responsibility for their own ICT learning.

4. It is further recommended that professional development policies by Ministry of Education and Sports and PTCs should support ICT-related teaching models in PTCs, in particular for those that encourage both students and teachers to play an active role in teaching activities. Additionally, emphasis should be placed on the pedagogy underlying the use of ICTs for teaching and learning. Educationists should harness the potential of ICT to complement the role of a teacher in the teaching and learning process not only in PTCs in Northern Uganda but also countrywide.

REFERENCES

Akankwasa, P. (2008). *Problems affecting the level of computer use for instructional purposes by technology teachers in government schools in Uganda.* Unpublished Bachelors□.

Al-Alwani, A. (2005). *Barriers to Integrating Information Technology in Saudi Arabia Science Education*, Doctoral dissertation, the University of Kanaas, Kanaas.

Amin, M. E. (2005). *Social Science Research: Conception, Methodology & Analysis.* Makerere University printery.

Barbe, W., B., & Swassing, R. H.,with M.N. Milone.(2009). *Teaching through modality strengths: Concepts and practices.* Columbus, OH: Zaner-Bloser.

BECTA, (2004). A Review of the Research Literature on Barriers to the Uptake of ICT by Teachers. *British Educational Communications and technology Agency.*

BECTA, (2003). What the research says about using ICT in Maths,*British Educational Communications and Technology Agency.*

Blurton, C. (2007). *New Directions of ICT-Use in Education' UNESCO. Retrieved*

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

Collis, B. (2002),*information technologies for education and training.* In Adelsberger,H, Collis, B, & Pawlowski,J.9(Ed.)*Handbook on Technologies for information and Training.*Berlin: Springer Verlag

Dawes, L. (2001), *what stops teachers using new technology*? In M. leask(Ed.), *Issues in Teaching using ICT*, London: Routledge

DiCicco-Bloom, B. & Crabtree, B., (2006). The qualitative research interview, *Medical Education, 40*(4), 314-321.

Earle, R. S. (2002). *The integration of instructional technology into public education3: Promises and challenges*. ET Magazine,42(1),5-1.

Emans, B.(2004). *Integration of ICT in Education: Guidelines for School Directors and Policy Makers* - IPETCCO Consortium.

Farrell, G. (2007). *Survey of ICT in Education in Kenya, Uganda, Tanzania, Rwanda.* Washington, DC: infoDev / World Bank.

Gay, L. R. (2003). *Educational research: Competencies for analysis and applications*, 7th ed. Upper Saddle River, NJ: Merrill Prentice Hall.

Glen, F. (2007). *Survey of ICT and Education in Africa:Uganda Country Report ICT in Education in Uganda.*

Haddad, W. D. & Draxler, A. (2002). The dynamics of technologies for education. In W. D.Haddad & A. Draxler (Eds.), *Technologies for education: potentials, parameters, and prospects* (pp. 3-17). Paris: UNESCO.

Hennessy, S. (2010). *Developing the Use of Information and Communication Technology to Enhance Teaching and Learning in East African Schools: Review of the Literature.* Centre for Commonwealth Education & Aga Khan University Institute for Educational Development – Eastern Africa

Janczewski, L. J. (1992). Factors of information technology implementation in under-developed countries: Example of the West African nations. In S. Palvia, P. Palvia & R. M. Zigli (Eds.), *The Global Issues of Information Technology Management* (pp. 187-212). London: Idea Group Publishing.

Jensen, M. (2005). *The African experience: building both supply and demand.* Paper presented at the InfoDev Workshop.

Kaweesa, C. (2002, June 10). *From chalk to ICT: Uganda embraces ICT-supported education strategy.* Retrieved 11 September 2013 from http://www.iicd.org/articles/IICDnews.import 1845

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.

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.

Okaka, T. (2011). *Promoting Widespread Diffusion of ICTs to Speed up Achievements of the MDGs in Africa*: a Case for the MDG 2 in Uganda

Pierson, M. E, & Cozart, A. (2005), Case *studies of future teachers; Learning to teach with technology,* journal of Computing in Teacher Education, 21(2),59-63.

Ramboll Management, (2006). E-learning Nordic 2006: *Impact of ICT on education.* Copenhagen: Finnish national board of education, Swedish National agency for School Improvement, Norwegian Ministry of Education and Research, Danish ministry of Education.

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.

Stephenson, J. (2001). *Learner- managed learning- an emerging pedagogy for online learning.* Teaching and Learning Online: *Pedagogies for New Technologies*. London, Kogan Page.

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.

Tabura, A. & Bakkabulindi, F. E. K. (2008). *ICTS and Teacher Productivity in Primary Schools in Mukono District.* East African Institute of Higher Education Studies & Development, School of Education, Makerere University, Kampala, Uganda

Tella, A., Tella, A., Toyobo, O. M., Adika, L. O., & Adeyinka, A. A. (2007). *An Assessment of Secondary School Teachers Uses of ICTs: Implications for Further Development of ICT's Use in Nigerian Secondary Schools.* Online Submission, 6(3).

Thijs, A., Almekinders, R., Blijleven, P., Pelgrum, W. J. & Voogt, J. (2001). *Learning through the web: A literature study on the potential uses of the web for student learning.* University of Twente, Enschede.

Trucano, Michael. 2005. *Knowledge Maps: ICTs in Education.* Washington, DC: infoDev / World Bank.

Uganda Communications commission, (2005). *Draft policy for information and communication technology in the education sector.*

Unwin, T. (2005). Towards a framework for the use of ICT in teacher training in Africa. Open Learning. *The Journal of Open and Distance Learning, 20*(2), 113-129.

Were, E., Rubagiza, J., Denley, P., & Sutherland, R. (2007). *The use of ICT to support basic education in disadvantaged schools and communities: a review of literature*: EdQual RPC (Rwanda).

Yelland, N. (2001). *Teaching and learning with information and communication technology(ICT) for numeracy in the early childhood and primary years of schooling.* Australia: Department of Education, Training and Youth Affairs.

Young, J (2002). The 24- hour professor. *The Chronicle of Higher Education, 48(38), 31-33.*

Zhang, P. & Aikman, S. (2007). Attitudes in ICT Acceptance and Use. In J. Jacko (Ed.), *human-computer interaction, part 1,* NY: Springer-Verlag Berlin Heidelberg.

Zhao, Y. & Frank, K. A (2003). An Ecological Analysis of Factors Affecting Technology Use in Schools. *American Educational Research Journal, 40(4):807-840.*

APPENDICES

Questionnaire for the tutors in PTCs

Dear respondent,

This questionnaire is for the purpose of collecting data needed for research study. It is **NOT** meant for any other purpose. Therefore, the information provided herein will be kept with utmost confidentiality. You are kindly requested to cooperate in answering the questions honestly to provide the required information. The topic of study is '' *Information and Communication technology use in Instructional Management in Primary Teachers' colleges.*''

BACKGROUD INFORMATION (*Please tick the right option or fill in the blank spaces where applicable)*

Name of College.....

Type of College1 Core ☐ Non Core ☐

1. Gender 1. Male= ☐ 2. Female = ☐

2. Age range (*Please tick from the table below only one of them).*

1.

Age	20-23 yrs	24-26 yrs	27-29 yrs	30-33 yrs	34-37 yrs	38-41 yrs	42 and above yrs

2 Highest level of education attained (*Please tick one of them).*

Qualification	Diploma	First Degree	Masters Degree	Others, Specify

3 Subject(s) of specialization

i. .....
.....

ii. .....
.....

5. For how long have you been a tutor?

1-5yrs ☐ 6-10Yrs ☐ 11-15Yrs ☐ 16+ yrs ☐

6. Were you trained in the use of Computer?

Yes ☐ No ☐ Others ☐

7. If **yes** who sponsored the training? (*Tick appropriate answer from the boxes provided below*)

Ministry of Education and Sports/College ☐ self sponsored ☐

8. Does the College have a functional computer laboratory?

Yes ☐ No ☐

(a) Tick the ICT resources available in the College and their status.

	Available	**Functional**	**Sometimes functional**	**Rarely functional**	**Not at all**
Computers					
LCD projector /Beamer					
iPod					
Smart phone					
Digital camera					
Internet					
Digital Television					
Digital radio					
E-mail for the College					
Video Camera					
Scanner					

Printers					
Photocopiers					
Smart board					
Stencil cutter					
ipad					

9. Indicate by ticking the time you spend using ICT in a week in your work place.

No of hrs	**Tick**
0-2HRS	
3-5HrS	
6-8 Hrs	
9-11Hrs	
12-14 Hrs	
15 and above Hrs	

10. In this College majority of tutors use ICT to what areas? _____

_____

_____

_____

_____

_____

_____

11. In this College majority of tutors do not to use ICT for what reasons? _____

_____

_____

_____

_____

_____

12. What challenges do tutors face in using ICTs in Instructional Management in the College

_____

_____

_____

_____

_____

_____

_____

14. What are some of the suggestions for encouraging the use of ICT _____

_____

_____

_____

_____

_____

_____

_____

THANK YOU

Students questionnaires

Dear Student,

You are kindly requested to fill this questionnaire as carefully and correctly as possible. The questionnaire is based on the ***ICT use in Instructional Management in Primary Teachers' Colleges.*** The information provided will be kept very confidential.

Name of

College.....

Instructions

Please tick in boxes

Personal information

1. Gender: Male ☐ Female ☐
2. Year of study Year 1 ☐ Year 2 ☐
3. Age range (*Please tick from below only one of them).*

	17-19Yrs	20-22Yrs	Above 23Yrs
Age			

4. Does the college have a functional computer laboratory?

   Yes ☐ No ☐

   Indicate the ICTs you have been using or used by tutors and the condition of the ICT resource

ICT resources	**Available**	**Functional**	**Sometimes functional**	**Rarely functional**	**Not at all**
Computers					
LCD projector /Beamer					
iPod/ ipad					
Smart phone					
Digital camera					
Internet					
Digital Television					
Digital radio					
E-mail for the College					
Video Camera					

Scanner					
Printers					
Photocopiers					
Smart board					
Stencil cutter					

5. Are tutors making use of ICT in the teaching and learning activities?

   Yes ☐ No ☐

6. Mention specific subject(s) taught using any ICT resource(s).

   i. .....

   ii. .....

   iii. .....

   iv. .....

7. How interesting do you find lessons taught involving ICT resources.

a. Very interesting ☐

b. Interesting ☐

c. Dull ☐

d. Very dull ☐

8. In this College the following obstacles were given as reasons for not using computers by the tutors.

Reason	**Agree**	**Disagree**	**Not sure**
Lack of access			
Resistance to change and negative attitude			
Lack of time			
Lack of training			
Lack of technical support			
Lack of tutors' competence			
Lack of confidence			
Inefficiency of Institutions computer laboratory			
Shortage of computers used by tutors			
Inadequacy of computers used by students			
Difficulties of improper teaching methods for tutors' usage			

Inadequacy of the courses of technology offered to tutors			

9. What could be done to promote the use of Computer and other technologies in the college by student teachers? _____

_____

_____

_____

_____

_____

_____

THANK YOU

Questionnaire for Principals

Dear respondent,

This questionnaire is for the purpose of collecting data needed for the research study. It is NOT meant for any other purpose. Therefore, the information provided herein will be kept with utmost confidentiality. You are kindly requested to cooperate in answering the questions honestly to provide the required information. The topic of study is '' *Information and Communication technology use in Instructional Management in Primary Teachers' colleges.''*

Name of College.....Type of College.....

1. Does the College have a functional computer laboratory? (*Tick YES or No from the boxes provided below)*

Yes ☐ No ☐

(a) If **No,** give reasons

.....

.....

.....

.....

.....

.....

.....

.....

(b) . If YES confirm by ticking the ICT resources available in the college and their status.

ICT resources available	**available**	**functional**	**Sometimes functional**	**Rarely functional**	**Not at all**
Digital Television					
Computer					
LCD Beamer/Data projector					
Digital radio					
Internet					

Scanner					
Printer					
Smart phone					
iPod					
E-mail					
Photocopier					
Smart board					
Digital Camera					
Stencil cutter					

c. In this College majority of tutors use ICT to what areas? _____

_____

_____

_____

_____

_____

_____

d. In this College majority of tutors do not to use ICT for what reasons? _____

_____

_____

_____

_____

_____

_____

e. What challenges do tutors face in using ICTs in Instructional Management in the College?

_____

_____

_____

_____

_____

_____

_____

f. What are some of the suggestions for encouraging the use of ICT? _____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU

Interview guide for key informants

What is your view on the availability of ICT resources in this PTC?

To what extent are ICT resources utilized in this PTC?

What are the perceptions of student teachers on the use of ICTs in instructional management by tutors?

What would you recommend for improving ICT accessibility and use in instructional management?

Letter of Introduction

KYAMBOGO UNIVERSITY

P. O. BOX I KYAMBOGO, KAMPALA - UGANDA
Tel: 041 - 285211 Fax: 220464
www. Kyambogo.ac.ug

Department of Educational Planning Management

Date: 1st November 2012

TO WHOM IT MAY CONCERN

This is to certify that **Mr. OKETTA George, Reg. No. 2010/U/HD/047/MEPPM** is a student in our department. He is carrying out research as one of the requirements of the course. He requires data and any other information on this topic entitled:

Information and Communication technology Use in Instructional Management in P.T.Cs in Northern Uganda.

Any assistance accorded to him is highly welcome. He is strictly under instructions to use the data and any other information gathered for research purposes only.

Thank you

Kyambogo University
FACULTY OF EDUCATION
01 NOV 2012
HEAD OF DEPT.
EDUCATIONAL PLANNING & MGT.

Okongo Wilberforce
HEAD OF DEPARTMENT