ROLE OF ICT TRAINING WORKSHOPS IN INTEGRATING ICT IN TEACHING IN

SECONDARY SCHOOLS IN THE CENTRAL REGION

OF UGANDA

BY

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DECLARATION

I, Sam Rico Ariko hereby declare that this dissertation is my original work and has not been presented for a degree in any other university.

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Date: -----

APPROVAL

This is to certify that this dissertation titled," Role of ICT training workshops in integrating ICT in teaching in secondary schools in central region of Uganda" is an original work of Sam Rico Ariko. It has been done under my supervision and has been submitted for the award of a higher degree with the approval of the supervisor:

Signature..... Date.....

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DEDICATION

I dedicate this work to my mother Mrs. Ajiro Mary Emadit, without whom I would be no where. The success of this work is an answer to your persistent prayer for my graduation from one level to another.

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ABSTRACT

This study was conceived to investigate the role of training workshops in some aspects of ICT for integration of ICT in teaching in secondary schools in central region of Uganda. The study was driven by objectives to investigate the relationship between training workshops on ICT networking, maintenance of ICT facilities and ICT integration in teaching in secondary schools in central region. It is further believed that teacher's attitude towards ICT plays a motivational role that facilitates integration of the practice in teaching. The study was therefore also to investigate the role of attitude towards ICT integration in teaching in secondary schools in central region of Uganda. In the study, it was hypothesized that the independent variables (training workshops in networking, maintenance of ICT facilities and teachers' attitudes) have significant positive effect on integration of ICT in teaching in secondary schools in central region of Uganda. The study was conducted with two secondary schools (where ICT training workshops had been held) from each of the following districts: Kampala, Wakiso, Mukono and Mpigi. Eight schools, with estimated population size of 200 teachers were used, from which a sample of 100 respondents participated in the study. The data was analyzed using SPSS computer soft ware; in which Pearson's coefficient correlation was used to determine relationship between dependent and independent variables. Study finding based on test of hypotheses showed that training workshops have positive correlation coefficient with integration of ICT in teaching in secondary schools in central region. The study stated that training workshops in ICT networks, maintenance and the teachers' attitudes have a positive relationship with integration of ICT teaching in

secondary schools in central region. Based on this finding, the researcher recommended that training workshops should be encouraged as a means to expose teachers to the use of computers, which knowledge could use in their normal class room teaching.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This Chapter looks at the background, statement of the problem, purpose, objectives, research questions, hypotheses, scope, significance and justification of the study.

1.1 Background

Background information is categorized into; historical, theoretical, conceptual and contextual perspectives;

1.1.1 Historical perspective

The issue of integrating ICT in teaching started way back in 1980s, when relatively cheap microcomputers became available for the consumer market (Pelgrum & Law, 2003). It was believed that with introduction of ICT integration in teaching would make education more effective and motivating. Also Hepp, Hinostroza, Laval and Rehbein (2004) claim that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers were not being fully integrated in the learning of traditional subject matter, educationists believed that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICTs (Pelgrum & Law, 2003). Kozma & Anderson (2002) indicate that education is at the core of the knowledge economy and learning society and that correspondingly, the role of ICTs in schools is shifting dramatically.

And according to Bitner & Bitner (2002), it was the skill and attitude of the teacher that determined the effectiveness of technology integration into the curriculum. That once teachers developed skills, they could begin to find ways to integrate technology into their curriculum and demonstrate its use to others. If learning was the impetus that drove the use of technology in the school, teachers and students could be partners in this, changing traditional paradigms of the teacher providing wisdom and the student absorbing knowledge.

1.1.2 Theoretical Perspective

The study was based on Human Capital Theory which emphasizes that; individuals and the society at large derive productivity gains by investing in people. Human capital formation is based on the view that people have skills, experience and knowledge, which are forms of human capital (FlamHoltz and Lacey, 1981). Human capital development in this case is reflected in form of teacher's ability to integrate ICT to facilitate teaching and learning. Hence, this study is based on the assumption that ICT training workshops should enhance ICT integration.

1.1.3 Conceptual Perspective

According to UNESCO (2006), Information and Communication Technology (ICT) refers to the different forms of technology that are used to transmit, store, create, share or exchange information. ICT training workshops are perceived by the teachers as time spent on training other than training outcomes such as proficiency in the skills, comfort with the technology or experience in integrating ICT in teaching. ICT training workshops in schools include basic computer literacy, exposure to the basics of using emails, search engines, website design, computer networks, maintenance and the integration of technology in the classroom, in a

concentrated period with groups at various levels of competence. In the study ICT training workshops looked at the ability of teachers to effectively use networked environment in their teaching profession, maintain available ICT hardware and software, then the study also tried to establish teachers' attitudes towards these ICT workshops. On the other hand, ICT integration basically considered the ability of teachers to use ICT tools such as Power Point projectors and desktop computers to illustrate in a normal classroom environment. Further, ICT integration put into account teachers' skills in using computers and internet to search for relevant instructional materials.

1.1.4 Contextual perspective

Organizations like School Net Uganda, African Pedagogical ICT (APICT) came up to help different secondary schools in Uganda to integrate ICT in teaching. Several schools from the Central Region have been beneficiaries of such workshops, schools like: Gayaza High School, Kibuli Secondary School, King's College Budo, Kitante Hill School, Lubiri Secondary School, Makerere College School, Mengo Secondary School, St. Joseph's Naggalama and Nabisunsa Girls School (*www.geocities.com* / *schoolnetuganda*). By introducing ICTs into these schools, the objective was to assist teachers acquire the necessary skills of integrating ICT in teaching. It is still however not clear whether the introduction of ICT in these schools has resulted into any positive output. Whereas there could be several factors that limit integration of ICT in teaching, training workshops in areas of networks, maintenance and teachers' attitude could be one of them. This may results in misuse of ICT in many schools whereby instead of using ICT for valued academic areas schools will apply ICT in irrelevant fields. However, even schools with ICT facilities and where several ICT training workshops have taken place in areas of computer

networks, maintenance, knowledge about integrating ICT to teach, teachers have not been able to integrate ICT in teaching.

1.2 Problem statement

In Uganda since the mid-1990s, there has been a rapid rise in interest in the use of ICTs in schools. According to a report by Uganda National Council for Science and Technology (UNCST 2002), schools lack ICT resources and skills which directly affects the integration of ICT in teaching. Information and communication Technology (ICT) training workshops are very fundamental to achieving priorities in local and international economies in the Twenty-First Century. To meet this challenge, many governments in Africa and Uganda in particular have invested tremendously in information technology in schools. However, increased spending on ICT in schools does not necessarily guarantee improved teaching and learning environments and improved student outcomes (Centre for Research on Information Technology and Organizations, 1999; White, 1999). Despite the many ICT training workshops in secondary schools in Central Region, there seem to be no major ICT developments as far as integrating ICT in teaching in many of these secondary schools, hence raising a concern to find out whether computer training workshops in networks, maintenance plus teachers' attitudes towards ICT have a significant positive relationship with integration of ICT in teaching in secondary schools.

1.3 Purpose

The purpose of the study was to find out the role of ICT training workshops in integrating ICT in teaching in secondary schools in the Central Region in Uganda.

1.4 Objectives

The objectives of the study were;

- 1. To investigate how training workshops on ICT networks relate to integrating ICT in teaching in secondary schools in the Central Region.
- To find out the extent to which training workshops in maintenance of ICT facilities in schools relates with integration of ICT in teaching in secondary schools in Central Region.
- 3. To investigate how teachers' attitudes towards ICT training workshops contribute to the integration of ICT in teaching in secondary schools in Central Region.

1.5 Research Questions

The research questions of the study were;

- 1. How does training workshops in ICT Networks relate to the integration of ICT in teaching in secondary schools in Central Region?
- 2. How do training workshops in maintenance of ICT facilities in schools relate with integration of ICT in teaching in secondary schools in Central Region?
- 3. What are teachers' attitudes towards ICT training workshops affect the integration of ICT in teaching in secondary schools in Central Region?

1.6 Research Hypotheses

The hypotheses of the study were;

1. Training workshops in ICT Networks have a positive relationship with integration of ICT in teaching in secondary schools in Central Region.

- 2. Training workshops in maintenance of ICT facilities in schools have a positive relationship with integration of ICT in teaching in secondary schools in Central Region.
- 3. Teachers' attitudes towards ICT training workshops have a positive relationship with integration of ICT in teaching in secondary schools in Central Region.

1.7 Scope

The study basically looks at the relationships between ICT training workshops and integration of ICT in secondary schools in the Central Region in Uganda. It looked at the different categories of ICT training workshops, that is: computer network training workshops, workshops in maintenance of ICT facilities in schools and teachers' attitudes towards the different ICT training workshops. The study targeted secondary school teachers, considering two secondary schools from each of the following Districts where ICT training workshops were held; Kampala, Wakiso, Mukono and Mpigi.

1.8 Significance

The study findings are to help the organizers of different ICT training workshops such as SchoolNet, Uconnect, Connect-Ed, African Pedagogical Information and Communication Technology (APICT), educational administrators and Ministry of Education and Sports identify suitable skills in networks and maintenance that contribute to integration of ICT in teaching in secondary schools. Further, the study findings are to facilitate the body of researches being carried on role of ICT in education which may lead to better and more applicable findings.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter includes the theoretical review, conceptual framework and the review of related literature.

2.1 Theoretical Review

The Theory of Human Capital which was developed by Adam Smith during the 18th Century is based on the belief that individuals and the society at large derive productivity gains by investing in people. It is argued that such investments, aimed at exploiting the utmost potential of people, should target areas such as education improvement which can be in form of developing teachers' skills (Schultz, 1963). Human capital formation is based on the view that people have skills, experience and knowledge, which are forms of capital - human capital (FlamHoltz and Lacey, 1981). Training workshops aim at staff development, although some authors have argued that this approach to staff development to integrate ICT in teaching also addressed other common barriers related to; attitudinal changes of traditional teacher roles and fear of technology, as well as the relevancy of the training to the instructional setting (Schmid, Fesmire, & Lisner, 2001). Staff development in form of training teachers in areas of ICT such as; computer networking and maintenance will support integration of ICT in teaching.

2.2 Conceptual Framework

This section shows how the different variables of the study relate.



Figure 1: Conceptual diagram showing the relationship between ICT training and ICT integration

Source: Self concept

In Figure 1, it was conceptualized that ICT training workshops in form of computer networks training workshops, workshops on maintenance of ICT facilities (hardware and software) and then also teachers' attitude towards the different ICT training workshops have a great contribution to the integration of ICT in teaching. Such factors have been highlighted to have significantly affected the way ICT is used in illustrations and search for new materials in teaching. However, there are other factors which might be also very influential in integrating ICT in teaching and these may include: financial services to purchase necessary ICT equipments and

school administration to monitor and maintain ICT facilities. But these two and other factors of the kind will be held constant in this study.

2.3 Review of Related Literature

In reviewing the related literature of this study, it is categorized according to the study objectives.

2.3.1 Training workshops on computer networks and integrating ICT in teaching

Computer networking refers to the of data processing nodes that are interconnected for the purpose of data communication, a communications network in which the end instruments are computers. Such computers can also be connected to the Internet. A school has to be a space where the construction of knowledge and social improvement are operated in a way that student feels as human being with interests and own needs. In this regard, schools need all ICT components that will boost teaching and learning such items includes computer networks.

Factors that accompany the successful implementation of ICTs in schools are both networks of connectivity and teacher training in ICT (Howell and Lundall, 2000). The more confident the teachers, the more integrated and innovative uses are made of ICTs. It is claimed that teachers who have attained a high sense of self-efficacy and comfort level with telecommunications are usually those who have adopted them in the classroom (Sherry, 1998). Teachers who find it easy with installations or troubleshooting network problems have the enthusiasm to employ ICT in their daily teaching. The provision of support for teachers and the development of networks form part of teachers' training. These networks offer coordination and support functions for educators and are cited as one of the factors enabling a school to overcome barriers created by inadequate

resources (Howell and Lundall, 2000). Past studies Howell and Lundall, (2000) "factors that accompany the successful implementation of ICTs in schools are both networks of connectivity and teacher training in ICT"; Sherry, (1998)

2.3.2 Training workshops in maintenance of ICT facilities in schools and integration of ICT in teaching

Like many developing countries and East Africa in particular ICT in schools has been limited to computer literacy training (Muriithi, 2005), although teachers need to possess other relevant skills like computer maintenance skills and repair which will sufficiently enable teachers to use ICT as a teaching tool. In many instances low integration of ICT in schools has been as a result of lack of human capital, knowledge, and incentive and skills. There is a growing awareness of how large the training and professional development needs are, not only in relation to pedagogy, curriculum change, IT skills and awareness, but also in relation to wider cultural change issues, as school systems develop and roll out new systems and processes over time (Conlon & Simpson, 2003).

In schools, the costs of installation, maintenance and expansion of ICT services in schools have been considered great contributors of integration of ICT in the curriculum (Lynch, 1999). Teachers require the possession of skills to do at least simple computer maintenance in schools if ICT if to be boosted in learning. This is because; the increased breakdown of ICT facilities in schools has been as a result of incompetence on the side of computer users. Teachers and students equally need the simple maintenance skills. The problem most often noted by teachers regarding integration of ICT in teaching was the maintenance of ICT equipment needed to operate a technologically enhanced school (Reid, 2002). Placing technology in schools and mandating an ICT program of studies is not enough to enable teachers to acquire the skills and proficiencies to use them effectively (Breuleux, 2001), what is important is the integration of well-designed technologies in the context of meaningful, mindful inquiry projects and adequate support for technological maintenance and pedagogical renewal. Several past study findings were corroborative of this: Reid (2002) noted that most problem regarded by teachers on integration of ICT in teaching was maintenance of ICT equipments. Lynch (1999);

2.3.3 Teachers' attitudes towards ICT training workshops and integration of ICT in teaching

Integration of ICT in schools highly depends on teachers' attitude towards the use of ICT in teaching, if teachers have a positive intention to use ICT, then they are likely to perceive these training workshops in ICT as relevant. ICT integration is influenced by the teacher's beliefs about the value of ICT and beliefs about the control he or she has in his or her professional practice. The attitude towards using ICT in one's teaching will also be influenced by the personality traits of the individual teacher. The skill and attitude of the teacher is a key determinant in the effectiveness of technology integration into the curriculum (Bitner & Bitner, 2002). Five major factors have generally been regarded as sufficient to describe people's wide variety of trait descriptions: Extraversion-introversion; agreeableness; conscientiousness; Emotional stability; and culture as observed by (Norman, 1963 in Ajzen 1988:19). In the Ugandan situation, the impact of personality on behavioural change may mean that if a teacher is extraverted and conscientious, is more likely to adopt new methods in teaching than someone who is cautious and nervous about change.

Research into people's attitudes that might influence their adoption of certain behaviours has shown that "the attitude toward behaviour is determined by salient beliefs about that behaviour, termed behavioural beliefs" (Ajzen, 1988:120). In relation to teachers, these beliefs might include the effects on their role as a teacher, the impact on pupils' motivation, the impact on the teachers' influence in the school, how the behaviour might affect other teachers and so on. Furthermore, we might expect that teachers' attitudes towards using ICT can be influenced by the information they have about the value of ICT, their previous experiences in using ICT, their expertise in using ICT and the expectation that it will contribute to their pupils' learning. Teachers' attitudes towards integrating ICT is highly influenced by the perceived locus of control, which is the ability of the teacher to control usage of ICT in teaching but not technology to run teaching automatically (Blumenfeld, 1992). It has been noted that if teachers develop a negative attitude towards using ICT in teaching even ICT uptake in schools will be slow (Cox, Preston and Cox, 1999). Therefore, this section is to identify the motivational factors, which indicate a positive attitude of teachers towards ICT and its value to education. Past studies (Bitner and Bitner 2002) showed that the effectiveness of technology integration in teaching is determined by teacher's attitudes. That, teachers who perceived training workshops as good had much better attempts of applying ICT in teaching. Ajzen, 1988; Blumenfeld, 1992; Cox, Preston and Cox, 1999 all talk about the correlative factor of behavioral ability on use of ICT, and subsequently the impact on teacher's influence in schools and pupils'.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This Chapter looks at the following Sections: the study design, population, sampling strategies, data collection, instruments, quality control, data collection procedure, analysis and interpretation.

3.1 Design

During the study the researcher got the information guided by questions like: "what is", "how much", "how often" "how many" which were assigned with numbers that called for a quantitative research approach. Since the study aimed at finding the relationship between ICT training workshops and integration of ICT in teaching it involved a correlative research design to find out the nature of the relationship between the two variables.

3.2 Population

The study targets a population of approximately 200 teachers in secondary schools in the Central Region which received ICT training workshops that aimed at promoting the integration of ICT in the curriculum through equipping both teachers and pupils with the necessary ICT skills. The schools targeted by this study have been offered with a good number of ICT facilities and they have been able to participate in several training workshops on networking and maintenance of ICT facilities. About eight schools from the Central Region have been part of this programme. In these eight schools, the estimated number of teachers who attended ICT training workshops close to 200 and according to Krejcie and Morgan (1970) in Amin (2005), with a population size of

200, the desired sample size should be near to 100 respondents. For this study the researcher aimed at least getting fourteen participants from each school making a total of 112 participants.

3.3 Sampling strategies

Since the study was carried out in a limited time, the researcher was not able to include all schools which participated in ICT training workshops from the Central Region, hence this calls for sampling just a few schools to participate in the study. Due to the fact that the researcher wanted the information from teachers who had attended the workshops ,a purposive sampling strategy was employed whereby the researcher examined the targeted population and then selected only eight schools that participated in the study. Only schools which attended the specific ICT training workshops were involved in the study.

3.4 Data collection methods

To gather primary data, the researcher designed a questionnaire for teachers because questionnaires are easy to administer in terms of time.

3.5 Data collection instruments

The questionnaire (Appendix A) was divided into different sections that is: Background, training in computer networks, training in maintenance of ICT facilities and the teachers' attitudes towards ICT training workshops and ICT integration.

3.6 Data quality control

The quality of data was mainly maintained in two ways; validity and reliability;

3.6.1 Validity

The instrument was given to people in the School of education from Makerere University to evaluate the relevant questions and also the same instrument was reviewed by the supervisor for further scrutiny and thereafter subjected to Content Validity Index (CVI) whereby;

CVI = <u>number of items receiving positive ratings of content relevance from all raters</u>

Total number of items on measure

If the answer calculated was between 0.64 to 1.0, then the instrument will considered valid, that is according to Cronbach (1971). The study had a total number of 29 items to measure and out of these 25 items were considered very crucial (received positive ratings), thus CVI = 0.86, which is close to 1.0 reflecting validity of the instrument.

3.6.2 Reliability

The instrument was tested in a school which was not part of the sample and results got were subjected to Cronbach's alpha (α). According to Cronbach the closer the Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. And according to the pilot study; the calculated average of Cronbach's alpha coefficient was 0.81, that is; section B= .76, section C = .83, section D = .72 and Section E = .91.

3.7 Data collection procedure

After obtaining a letter from the Dean, School of Education, Makerere University introducing the researcher and indicating his study aim, the researcher made visits to the different schools to seek permission from head teachers. Immediately after getting the school arrangements, the researcher

with two other research assistants went and collected data from these schools. After collecting data from the eight schools sampled, data were taken for analysis and interpretation.

3.8 Data analysis

All data collected was verified to see that only correctly filled up questionnaires are considered for analysis; thereafter responses were be coded to institute them to a quantitative type of analysis. Only codes were entered into the computer using Statistical Package for the Social Sciences (SPSS). The data was then subjected to a quantitative analysis to look at the variations and also to measure the relationships between the independent and dependent variables. To measure variations between the independent variables and the dependent variables the researcher used, ANOVA and students' T-test while to verify the three stated hypotheses, the researcher used Pearson Product-Moment correlation Index.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction:

This Chapter gives a description of the background, dependent and independent variables and verification of hypotheses.

4. 1 Description of respondents' background

This Section gives a description of the background of respondents by school, age, gender, home district and respondents' level of education. Table 4.1 gives summary of respondent by school:

Name of School where respondents' teach	Frequency	Percent
St. Joseph Girls' Nsambya	9	11.3
Mpoma Schools	7	8.8
Bweyogerere S.S	7	8.8
Seeta High School	11	13.8
St. John's college, Mpigi	13	16.3
St. Balikuddembe S.S	11	13.8
City High School	10	12.5
King's college Buddo	12	15.0
Total	80	100.0

Table 4.1: Distribution of respondents according to school

From Table 4.1, St. John's College, Mpigi had the highest number of participants (16%) followed by King's College Buddo with (15%). Setta High School and City High School had eleven participants each, representing 13%, while Mpoma and Bweyogerere Secondary Schools had the lowest of seven participants each (less than 9%) implying that they are slow at integrating ICT in teaching compared to the other schools in the study.

4.1.1 Respondents by age

In the study, respondents were also categorized according to age background. However for ease of interpretation, the variable age was grouped to form a new variable "age group", with summary of statistics shown on Table 4.2:

 Table 4.2:Respondents by age group

Age (years)	Frequency	Percent
Above 20 but below 35	50	62.5
Above 36 but below 55	29	36.3
Above 55	1	1.3
Total	80	100.0

Table 4.2 shows that the majority of teachers (almost 63%) were above 20, but below 35 years of age meaning that the teachers in that age group are more active in integrating ICT in teaching in secondary schools in central region.

4.1.2 Respondents by gender

Table 4.3 gives distribution of respondents by gender:

Table 3	3:	Resi	oond	lents	bv	gend	ler
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Gender	Frequency	Percent
Male	53	66.3
Female	27	33.8
Total	80	100.0

Table 4.3 shows that the majority of participants (66 %) were male, perhaps suggesting that there are more male teachers than females in the Central Region in Uganda.

4.1.3 Respondents by district

Table 4.4 gives the distribution of respondents by district:

Table 4.4:	Respondents	by district
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District name	Frequency	Percent
Kampala	20	25
Wakiso	19	24
Mukono	18	23
Mpigi	23	29
Total	80	100

Table 4.4 shows that all districts that participated in the study were almost equally represented, although Mpigi District had the highest number of respondents (29%), while Mukono district had the lowest number of participants (23%).

4.1.5 Respondents' level of education

Respondents were also described by education levels as summarized in Table 4.5:

			Cumulative
Education level	Number	Percent	percentage
Diploma	11	13.8	13.8
Degree	57	71.3	85.1
Postgraduate	12	15.0	100.1
Total	80	100.0	100.1

Table 4.5: Education level of respondents

According to Table 4.5, the majority of respondents (over 71%) that participated in the study were degree holders. The highest number of teachers being degree holders could be because it is the current requirement by Ministry of Education and Sports for secondary school teachers in Uganda. This has made most diploma holding teachers to go back to school to pursue a degree.

4.2 Description of the dependent variable: ICT integration in teaching

The dependent variable in the study (integration of ICT in teaching) was conceptualized using five questions which required each respondent to do a self rating on the variable, using a Likert

scale ranging from: 1 which represented Strongly Disagree to 4 which represented Strongly Agree. Table 4.6 shows summary of resulting statistics:

Statements relating to the Dependent variable	Mean	Std. deviation
I do not find any problem with integrating ICT in teaching	4.2	4.58
I now produce reports for my students using a computer	3.8	.70
I can now search for teaching materials from the internet	3.9	.62
I can store information on the computer and retrieve it when I need it	4.1	.77
Integration of ICT in teaching is the best way of improving teaching in secondary schools	4.0	.66

Table 4.6: Summary statistics on respondents' self-rating on ICT Integration in teaching

Table 4.6 indicates with a high of 4.2, the number of respondents that do not have any problem with integrating ICT in teaching, followed by those that say they can now store information on computer and retrieve them when they need (mean of 4.1). Teachers that said they can now design and produce reports for their students using computers had the lowest mean of 3.8. Table 4.6 further indicates (with a mean of 3.9), teachers' confession that they can search for information from the internet to enrich their teaching resources. Teachers further strongly agreed (mean = 4) that integration of ICT in teaching is best way to improve teaching in secondary schools in the central region.
4.2.1 ICT integration index

To get an overall picture of how teachers rated themselves on "ICT integration in teaching" all items in Table 4.6 were aggregated into one average index (IICT), which stood for Integration of Information Communication Technology, on which statistics were generated as shown on Table 4.7:

Statistics	Value
Mean	4.00
Median	4.00
Standard deviation	1.11
Skewness	3.48

Table 4.7: Summary statistics of IICT integration

Table 4.7 shows summary statistics of IICT index having an arithmetic mean of 4.0; with median of 4.0 and a standard deviation of 1.1. The arithmetic mean and median being equal suggests a normal distribution in levels of ICT integration. With a standard deviation of 1.11, this shows that the amount of variation around the mean is low; Histogram (Fig 4.1) shows the distribution of ICT integration.



Figure 4.1: Histogram for integration of ICT in teaching

The histogram shows fewer scores on either side of the extremes and model score lying between 2.0 and 4.0 hence producing a curve which shows a normal distribution with minimal skew-ness. This means the distribution of the scores for integration of ICT in teaching increased at one time and dropped again.

4.2.2 Variation of DV with background variables

The dependent variable was capturing the background information of the respondents (teachers) that is, their school, age and gender.

4.2.3 Variation of ICT integration in teaching with school

The study wanted to find out whether integration of ICT in teaching varied with the school. Table 4.8 shows related ANOVA results

Name of the school	Frequency	Mean	Std.Deviation	F	Sig.
St. Joseph Girls' Nsambya	9	3.73	0.30		
Mpoma Schools	7	5.60	3.09		
Bweyogerere S.S	7	4.11	0.32		
Seeta High School	11	3.29	0.82		
St. Johns college, Mpigi	13	3.92	0.28	3.840	.001
St. Balikuddembe S.S	11	3.87	0.45		
City High School	10	3.68	0.50		
King's College Buddo	12	4.30	0.22		
Total	80	4.00	1.11		

 Table 4.8: ANOVA on how Integration of ICT varied with school

The means from Table 4.8 suggests that these schools differed on integration level of ICT in teaching. Mpoma Secondary School scored the highest mean of 5.60 while Seeta High school lowest (mean = 3.29). With the F value 3.840, whose significance (sig) value of .001 is less than

 $\alpha = 0.05$. Hence we reject the null hypothesis that school does not affect the level of ICT integration in teaching at the five percent level of significance. This shows that there is a significant correlation between type of school and ICT integration in teaching. This implies that, the type of school can have an effect on the level of ICT integration in teaching.

4.2.4 Variation of Integration of ICT in teaching with respondent's age

This study also wanted to find out whether the age of teachers has any influence on integrating ICT in teaching. Table 4.9 shows the relevant ANOVA results

Table 4.9: ANOVA on how Integration of ICT in teaching varied with age of teachers

			Std.		Sig.
Age group	Frequency	Mean	Deviation		
Above 20 but below 35	50	4.10	1.29		
Above 36 but below 55	29	3.81	0.70		
Total	79	3.99	1.11	.619	.541

As seen on Table 4.9 the age groups differed on integration of ICT, whereby the age group above 20 but below 35 had a highest mean of 4.10 while those above 36 but below 55 had the lowest mean of 3.81 and the F value is .619, whose significance (sig) value of .541 is greater than $\alpha = 0.05$ which means that age does not necessarily affect Integration of ICT in teaching.

4.2.5 Variation of ICT integration in teaching with gender

The study also sought to investigate whether Integration of ICT varied with gender. Table 4.10

shows pertinent T- test results;

Gender of	Frequency	Mean	Std. Deviation	t	Sig. (2tailed)
respondents					
Male	53	3.81	0.58		
Female	27	4.24	1.73	-1.427	.157
				-1.088	.285
Total	80				

 Table 4.10: T- test results on how ICT Integration varied with gender

Table 4.10 suggests that females had better ICT integration abilities with a mean of 4.24 compared to males (mean = 0.58), although basing on the t value of -1.427 and its calculated significance (sig) value of .157 which is greater than $\alpha = 0.05$, the difference in means is not significant. Hence there is no significant difference in integration of ICT between males and females at the five percent level of significance.

4.2.6 Variation of Integration of ICT in teaching with district

This study also wanted to find out whether the districts from which the respondents were selected could have an effect on their level of integrating ICT in teaching. Table 4.11 shows the relevant ANOVA results.

District	Frequency	Mean	Std. Deviation	F	Sig.
Kampala	20	3.74	0.42		
Wakiso	19	4.23	0.27	.901	.445
Mukono	18	4.19	2.26		
Mpigi	23	3.88	0.35		
Total	80	4.00	1.11		

 Table 4.11: ANOVA on how Integration of ICT varied with district

Table 4.11 suggests that integration of ICT differed with districts of the respondents, with Wakiso attaining the highest mean of 4.23 while Kampala got the lowest mean of only 3.74. However the F value is .901 whose significance (sig) value is .445 greater than $\alpha = 0.05$ implying that much as there is a difference in means among the districts of respondents, this does not affect the level of integration of ICT in teaching.

4.2.7 Variation of integration of ICT in teaching with level of Education

The study further wanted to find out whether integration of ICT varied with respondents level of education. Table 4.12 shows pertinent ANOVA results;

Education level	Frequency	Mean	Std. Deviation	F	Sig.
Diploma	11	3.53	0.61		
Degree	57	4.10	1.22	1.263	.289
Postgraduate	12	3.93	0.80		
Total	80	4.00	1.11		

 Table 4.12: ANOVA on how integration of ICT in teaching varied with the level of education

Table 4.12 shows that integration of ICT differed with the level of education but not so much in that degree holders had the highest mean of 4.10 and diploma holders had a least mean of 3.53 and post graduate respondents had a mean of 3.93; with the F value of 1.26 whose significance (sig) value is .289 greater than $\alpha = 0.05$ meaning that much as there is a difference in means, level of education does not have a significant effect on ICT integration.

4.3 Verification of hypotheses

This Section tests the respective hypotheses in the study.

4.3.1 Hypothesis One

Hypothesis one stated that, training workshops in ICT networks have a positive relationship with integration of ICT in teaching in secondary schools, in the central region. In regard to this hypothesis, using seven questions the researcher asked respondents to do self rating basing on Likert scale ranging from one to represent Strongly Disagree to four to mean Strongly Agree. Descriptive statistics on respondents' self-rating of training workshops in networking are given in Table 4.13:

Table	4.13:	Summary	statistics	on	respondents'	self-rating	of	training	workshops	in
		Networks								

Questions	Mean	Std. Deviation
I have received good training in networking	3.8	.76
I have been trained to troubleshoot network problems	3.8	.82
I have been trained to access useful resources on the	4.0	76
internet	1.0	
I have been trained to send students' work online	3.7	.82
I have been trained to receive students' work on-line	3.7	.83
I was trained to conduct classes using computers	3.7	.94
I have benefited a lot from training in networks	3.8	.81

From Table 4.13, respondents indicated that they received good training in networks (mean = 3.8), that they were also trained in troubleshooting network problems at school/workplace and also at home (mean= 3.8). Respondents strongly agreed that they were trained in accessing relevant information from the internet to enrich their teaching content (mean = 4.0), again it was found out that teachers got training in sending, receiving students' work on-line and also conduct classes (mean = 3.7). Teachers further revealed that, they had really benefited a lot from these training workshops in networks (mean = 3.8).

To get an overall view of how teachers rated themselves on training workshops in networks, all items in Table 4.12 were aggregated into a single average index (TWN) which stands for training workshops in networking. To correlate the two indices that is; TWN and IICT (integration of ICT) Pearson's correlation co-efficient was used, and Table 4.13 gives pertinent results:

Table 4.14: Pearson's Correlation Co-efficient between Training workshops in Networks (TWN) and integration of ICT (IICT)

		Training workshops	Integration of
		in networks (TWN)	ICT (IICT)
Training in networks	Pearson Correlation	1	.383(**)
	Sig. (2-tailed)		.000
	Ν	80	80
Integration of ICT	Pearson Correlation	r =.383(**)	1
	Sig. (2-tailed)	p= .000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.14 indicates that, Pearson's Correlation Coefficient for training workshops in networks (TWN) and integration of ICT (IICT) was r = .383, that is positive with probability value (p = .000 less than $\alpha = 0.01$) reflecting a significant correlation, meaning that integration of ICT in teaching has a significant positive relationship with training workshops in networks in secondary schools in central region at the one percent level of significance. This implies that teachers who attained training in computer networks have a strong ability of integrating ICT while teaching.



Figure 4.2: Frequency histogram for training in networks.

The histogram shows the distribution of scores concentrated at the extremes, and the normal score lying between 1.8 and 5.0 thus producing a frequency curve which shows a normal distribution with minimum skew ness. This means the distribution of scores for training in networks tended towards the middle.

4.3.2 Hypothesis Two

Hypothesis two was stated that, training workshops in maintenance have a positive relationship with integration of ICT in teaching in secondary schools in the central region. In regard to this hypothesis, the researcher asked respondents to self rate the following items that are in line with training workshops in maintenance; do simple repairs on computers, solve computer problem without help of a lab technician, install computer programs and can identify up-to-date software. Respondents' self-rating was based on Likert scale ranging from one to represent strongly disagree and four to mean strongly agree. Descriptive statistics on respondents' self-rating of training workshops in maintenance are given in Table 4.15;

Table	4.15:	Summary	statistics	on	respondents'	self-rating	of	training	workshops	in
		Maintenand	ce							

	Number of		
Statement	respondents	Mean	Std. Deviation
I have received training in maintenance of ICT facilities	80	4.0	.75
I am able to do simple repairs on computers	80	3.6	.93
If a computer hangs up, I can solve the problem without help of a lab technician	80	3.3	.89
I can install programs on computers	80	3.5	.97
I can easily identify up-to-date my computer software.	80	3.6	.86

From Table 4.15, respondents indicated that they received good training in maintenance of Computers (mean = 4.0), and they agreed (mean = 3.6) that at least they can do simple repairs of their computers in case of a minor problem. Teachers (mean = 3.3) further revealed that, in case of a simple computer problem, they do not need to wait for lab technician, so they have good

skills in simple repairs. Respondents were also asked about their ability to install relevant programs on their computers, findings indicated that teachers agreed (mean = 3.5) that, they had no any problem with putting the necessary programs to be used on a computer. Respondents also indicated that, they could ideally find up to date programs deemed important in their field, this had a mean of 3.6.

To test this hypothesis to find out whether training workshops maintenance have a positive relationship with integration of ICT in teaching in secondary schools in central region, all items in (Table 4.15) were aggregated into a single index (TWM) which stands for training workshops in maintenance. To correlate the two indices that is; TWM and IICT (integration of ICT) Pearson's correlation co-efficient was used and table 4.15 gives the results.

		Training in	Integration of ICT
		Maintenance (TWM)	(IICT)
Training in	Pearson	1	(12(**)
Maintenance	Correlation	1	.413(**)
	Sig. (2-tailed)		.000
	Ν	80	80
Integration of ICT	Pearson	- 412(**)	1
	Correlation	f = .413(**)	1
	Sig. (2-tailed)	p = .000	
	Ν	80	80

Table 4.16: Pearson's Correlation Co-efficient between Training workshops in Maintenance (TWM) and integration of ICT (IICT)

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.16 shows that, Pearson's Correlation Coefficient for training workshops in maintenance (TWM) and integration of ICT (IICT) was r = .413, that is positive with probability value (p = .000) less than $\alpha = 0.01$ reflecting a significant correlation, meaning that integration of ICT in teaching has a significant positive correlation with training workshops in maintenance of computers in secondary schools in central region at the one percent level of significance. This means that teachers who trained in computer maintenance can easily integrate ICT while teaching.



Figure 4.3: Frequency histogram for training in networks

The histogram shows the distribution of scores concentrated in the middle, with the normal scores lying between 11.0 and 25.0 thus producing a frequency curve which shows a normal distribution with minimum skew ness. This means the distribution of scores for training in maintenance tended towards the middle.

4.3.3 Hypothesis Three

Hypothesis three was stated that, teachers' attitudes towards ICT training workshops have a positive relationship with integration of ICT in teaching in secondary schools in Central Region. To get information about this hypothesis, the researcher asked respondents to self rate the following items; I do not find any problem with integrating ICT in teaching, knowledge in

computer networks has greatly supported me in teaching using ICT, knowledge in computer maintenance has supported me in teaching using ICT, training workshops in ICT need to be improved if integration of ICT in teaching is to be achieved and Integration of ICT in teaching is the best way of improving teaching in secondary schools. Even on this hypothesis, respondents' self-rating was based on Likert scale ranging from one to represent strongly disagree and four to mean strongly agree. Descriptive statistics on respondents' self-rating of teachers' attitudes towards ICT training workshops are given in Table 4.17;

 Table 4.17: Summary statistics on respondents' self-rating of teachers' attitudes towards

 training workshops in ICT

	Number of		
Statements	respondents	Mean	Std. Deviation
ICT training workshops that I participated in were properly organized	80	3.9	.72
ICT workshops I participated in were adequate	80	3.9	.73
The training workshops in ICT I participated in covered areas I needed	80	3.7	.76
I welcomed the idea of ICT training workshops	80	4.4	.77
The Programme of training teachers in ICT integration should continue	80	4.5	.69
The Programme of training teachers in ICT integration has achieved its aim	80	3.8	.87

From Table 4.17, respondents indicated that ICT training workshops they participated in were properly organized (mean = 3.9), adequacy of the organized training workshops in ICT was perceived as being so good (mean = 3.9), as far as content covered in those ICT training workshops, respondents rated it as great (mean =3.7). All teachers almost liked the idea of training workshops in ICT which was reflected by a mean value of 4.4, and in relation to this, teachers recommended (mean = 4.5) that such programs (training workshops in ICT) should be continued, teachers also believed (mean = 3.8) that, these training workshops attained their objectives. For purposes of testing hypothesis three, that is whether teachers' attitudes towards ICT training workshops have a positive relationship with integration of ICT in teaching in secondary schools in Central Region, all items in (Table 4.16) were aggregated into a single index (TAT) which stands for teachers' attitudes towards training workshops in ICT.



Figure 4.4: Frequency histogram for teacher's attitudes towards ICT training workshops:

The histogram shows fewer scores on both sides of the extremes and a modal score lying in between 16.00 and 33.00 thus producing a curve which shows a normal distribution with minimal skew ness. This means the distribution of the scores for teacher's attitude towards ICT training workshops tended towards the central point. To correlate these two indices that is; TAT and IICT (integration of ICT) Pearson's correlation co-efficient was used, and table 4.17 gives the results.

 Table 4.18: Pearson's Correlation Co-efficient between attitudes towards training

 workshops in ICT (TAT) and integration of ICT (IICT)

		Teachers'	Integration of
		Attitude(TAT)	ICT (IICT)
Teachers'	Pearson Correlation	1	.317(**)
Attitude	Sig. (2-tailed)		.004
	Ν	80	80
Integration of	of Pearson Correlation $r = .317(**)$	r = .317(**)	1
ICT	Sig. (2-tailed)	p = .004	
	Ν	80	80

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.18 shows that, Pearson's Correlation Coefficient for Teachers' attitudes towards training workshops in ICT (TAT) and Integration of ICT (IICT) was r = .317, that is positive with probability value (p = .004) less than $\alpha = 0.01$ reflecting a significant correlation, meaning that integration of ICT in teaching has a significant positive correlation with teachers' attitudes towards training workshops in ICT in secondary schools in central region at the one percent level of significance. This means that teachers' towards the training workshops contributes to their ability to integrate ICT in teaching. That, teachers who perceived these training workshops as good had much better attempts of applying ICT in teaching while teachers who had a negative attitude towards these ICT training workshops had less interest and ability of infusing ICT in teaching.

CHAPTER FIVE

DISCUSSION, CONCLUSSIONS AND RECOMMENDATIONS

5.0 Introduction

This Chapter presents the outcome of the study, the conclusion drawn from the result of the study and recommendation based on the conclusion.

5.1 Discussion

This section presents the general discussion about the result of the study based on its overall purpose (to find out the role of ICT training workshops in integrating ICT in teaching in secondary schools in the Central Region in Uganda). It then presents the discussion of dependent variables (ICT integration in teaching) measured by application/ use of ICT tools in teaching (illustration and searching for instruction materials); and perceived attitude of teachers in integrating ICT in teaching, proxied by welcoming/ not welcoming ICT in teaching. The section ends with discussion of the different hypotheses in the study.

5.1.1 General discussion

In the study training workshop was perceived as time spent on training other than training outcomes; focused on basic computer literacy (exposure to the basics of using emails, search engines, website design, computer networks and maintenance). Training workshops in this study looked at the ability of teachers to effectively use networked environment in their teaching;

maintain available ICT hardware and software. Study also tried to establish teachers' perceived attitudes towards ICT workshops. On the other hand, ICT integration basically considered the ability of teachers to use (in teaching environment) ICT tools such as Power Point projectors and desktop computers; measured by illustration in a normal classroom environment and using computers and internet to search for relevant instructional materials.

The study showed that there is high ability of teachers to use ICT in normal class room; and also to use computers to search information and to send and receive work to and from students. Teachers who had earlier attended training workshops demonstrated high ability to integrate ICT in teaching in their schools. This finding supported the theoretical assumption of the study that ICT training workshops should enhance ICT integration in teaching in secondary schools in central region in Uganda. The finding also corroborated the assertion by Bitner and Bitner (2002) that the skills and attitude of the teacher determines the effectiveness of technology integration into the curriculum. Conceptually, the study revealed that although at varying degrees, training workshops (time spent on training) played a functional role to introduce teachers to the basic knowledge and skills of ICT which they later transferred into normal teaching practices, hence enhanced ICT integration in teaching.

Respondents (teachers) who claimed to have participated in training workshops in networking, maintenance showed welcoming attitude for ICT integration in teaching. They (respondents) also showed high ability to use the knowledge obtained from the workshops in class room environment for illustration; for communication and to search instructional materials in the Internet (Table 4.6). Respondents said they can now store information on computers and retrieve it when they need, others said they can now produce reports for students using computer; yet

others still said that they can send and receive student work on computer. This finding corroborated the hypothetical claim of the researcher that training workshops have positive relationship with ICT integration in teaching. It also corroborated earlier report suggesting that training is one way of raising ICT diffusion/ adoption (communication and acceptability), both formally and informally (Luyimbaazi, 1997, Zziwa, 2001, in Bakabulindi 2002: 191). Through training workshops, aspects of ICT are communicated to participants, which then create accepting ability of participants at the workshops and are consequently transferred into their work practices.

The study brought out that among categories of respondents (teachers), the ability to integrate ICT in teaching were high in female teachers compared to male teachers. This suggests that female teachers have high ability to integrate ICT in teaching upon attending training workshops. Of the significances of the study was to facilitate the body of researches being carried out on the role of ICT in education, for better and more applicable findings. Accordingly, findings of the study seem to suggest that organizers of training workshops should put more emphasis on female participation if ICT integration in teaching is to be accelerated.

The study further revealed agreement by teachers that integrating ITC in teaching was the best way to improve teaching in secondary schools. This finding edified the rationale/ justification of the study (to lead to better and more applicable findings) stated in the background of the study. The finding also corroborated past findings that informal exposure to ICT is very important for ICT diffusion adoption; ICT changes very fast leading to quick expiry of ICT study materials leaving the best way to cope with changing technology as informal means such seminars, conferences and workshops(Kasozi, 2002: 21, cited in Bakabulindi, 2002: 195).

The study also tried to establish teachers' attitudes towards ICT training workshops, on which the study revealed that most respondents showed perceived positive attitudes towards integration of ICT in teaching. Particularly, most respondents said that they do not have any problems with integration of ICT in teaching. Table 4.6. Participants also said that integration of ICT in teaching is the best way of improving teaching in secondary schools (mean= 4.0). The findings also corroborated earlier reports (Bakabulindi, 2002; Bitner and Bitner, 2002) on teacher's attitudes on ICT integration.

Conclusively, the study brought out that ICT training workshops in networking, maintenance and teacher's perceived attitude play positive roles in the integration of ICT in teaching. This finding seems to strongly agree with the researcher's claim that training workshops have a significant role in integrating ICT in teaching in secondary schools in central region in Uganda. This study leads to a conclusion that training workshops play important role in integration of ICT in teaching, and should therefore be encouraged.

5.1.2 Discussion of dependent variable (ICT integration in teaching)

The dependent variable in the study was ICT integration in teaching in secondary schools in central region in Uganda. Dependent variable was measured using two indicators: illustration and searching for materials (fig 1.0). The study found out that training workshop in networking, maintenance correlate positively with ICT integration in teaching. This was the expectation of the researcher because it was hypothesized that training workshops have positive relationship

with ICT integration in teaching. The finding confirmed the theoretical assumption of the study that ICT training workshops should enhance ICT integration in teaching in central region in Uganda.

The study established that teachers who had attended training workshops have high ability to use ICT in teaching for illustration in normal class room and to search instructional materials. In other words the study revealed demonstrated ability of teachers who attended workshops to integrate ICT in teaching. These findings lead to theoretical conclusion that if ICT training workshops in networking, maintenance are encouraged and supported then the level of ICT integration in teaching in secondary schools in central region in Uganda will increase.

This finding demystifies the concern raised by Center for Research and Information Technology Organizations, (1999); and white, (1999) that "despite the many ICT training workshops in secondary schools in central region, there seem to be no major ICT development as far as integrating ICT in teaching" in many secondary schools. In fact the findings show that ICT training workshops have positively impacted on actual use of ICT in teaching, thereby contributed significantly towards integration of ICT in teaching. If there are no observable impact as worried by CRITO, them it is attributable to other possible correlates; probably efficacy, comfort, accessibility geographical factors and student's attitudes. Because this study was controlled by its scope and design, it could not investigate on all these correlates; but however recommends it for further studies in order to clear the concern.

The study brought out that among categories of respondents (teachers), female respondents have high ability to integrate ICT in teaching compared to their male counterparts. It also showed that

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the ability to integrate ICT in teaching dropped with age of maturity (table 4.2). This finding seems to suggest that younger teacher should be encouraged and or facilitated (if need be) to participate in the training workshops if the speed of ICT integration in teaching is to be accelerated. The finding seem to confirm the long passed saying that "there is no need to teach an old dog new tricks"

5.1.3 Hypothesis one

The first hypothesis in the study was that training workshops on ICT networks have a positive relationship with integration of ICT in teaching in secondary schools in Central Region in Uganda. In the study networking referred to the network of data processing nodes that are interconnected for the purpose of data communication, a communications network in which the end instruments are computers. Such computers can also be connected to the Internet. Conceptually training workshop in network meant time spent to train teachers on the basics of using emails, search engines, website and computer networks. The study sought to support or reject the assertion; and was also interested on how training workshops on ICT networks relate to integrating ICT in teaching; (research question one).

To assess the relationship between ICT training workshops in Networks and integration of ICT in teaching, Pearson's correlation coefficient was used; the result of analysis revealed that training workshops in networking has a significant positive relationship with integration of ICT in teaching in secondary schools in central region in Uganda (Table 4.13: r = .383; p = .000). This outcome supported the assertion of the research (hypothesis one). The finding further agrees with results from past studies by: Howell and Lundall, (2000) "factors that accompany the

successful implementation of ICTs in schools are both networks of connectivity and teacher training in ICT"; Sherry, (1998) "teachers who find it easy with installations or troubleshooting network problems have the enthusiasm to employ ICT in their daily teaching". Teachers who had attended training workshop in networks could search for materials in the internet and could also send and receive student's work. In respect of this finding, the researcher therefore recommends the use of training workshops in Networking for use in integrating ICT in teaching in central region.

The study question one (how does training workshop in networking relate with integration of ICT in teaching in secondary schools in central region in Uganda?) was answered by this finding that training workshops in ICT networking introduced teacher to both network of connectivity and basic knowledge of computing. That networks offer coordination and support functions for educators enabling schools to overcome barriers created by inadequate resources (Howell and Lundall, 2000)

The findings of the study leads to contextual conclusion that training workshops in networking introduces teachers to the network of connectivity, enabling them to use the networked system to link to their students and to find instructional materials, and therefore have positive relationship with integration of ICT in teaching in secondary schools in central region in Uganda. Training workshops in networking therefore plays functional role in the integration of ICT that should not be ignored.

5.1.4 Hypothesis two

Hypothesis two in the study was that training workshops in maintenance have a positive relationship with integration of ICT in teaching in secondary schools in the central region. In regard to this hypothesis, research question two (how do training workshops in maintenance of ICT facilities in schools relate with integration of ICT in teaching) was formulated.

The study revealed a significant positive relationship between integration of ICT in teaching and training workshops on maintenance of ICT facilities (Table 4.15: p = .000, r = .413). This finding was in agreement with other study findings (Reid, 2002; & Lynch, 1999). This was the expectation of the researcher, as stated in the research hypothesis. This means that teachers who trained in computer maintenance can easily integrate ICT while teaching. Teachers require the possession of skills in simple computer maintenance in schools if ICT integration is to be boosted. This suggestion leads to theoretical conclusion that training workshops in maintenance plays significant role on integration of ICT teaching in secondary schools and should be encouraged.

5.1.5 Hypothesis Three

Hypothesis three of the study was stated that: teachers' attitudes towards ICT training workshops have a positive relationship with integration of ICT in teaching in secondary schools in Central Region.

The study revealed a significant positive relationship between ICT integration in teaching in secondary schools in central regions in Uganda and teachers' attitudes towards ICT workshops

(Table 4.18: r = 0.317(**); with probability value p = 0.004), supported the hypothesized positive relationship.

Finding also strengthened the assertion in the study that "integration of ICT in schools highly depends on teacher's attitudes towards the use of ICT in teaching; teachers that have positive intentions to use ICT are most likely to perceive training workshops in ICT as relevant; that ICT integration is influenced by teacher's believes on the value of ICT". This means that teachers' attitude towards the training workshops is a positive correlate to their ability to integrate ICT in teaching. Motivation to use ICT as possible influences to adoption of ICT use, hence in teaching in secondary schools. These findings are congruent to the theoretical assertion of the researcher that integration of ICT in teaching in secondary schools is highly dependent on teacher's attitudes towards use of ICT in teaching.

The findings together with its corroborative past studies conclusively suggest that teacher's attitudes on ICT use have positive influence on integration of ICT in teaching in secondary schools in central region. Without inferring statistical significant the researcher concludes that teachers (in central region) who perceive ICT training workshops as good, have the ability to use it in teaching. Therefore training workshops on ICT should be upheld and promoted to enhance teachers' ability to integrate ICT in teaching.

5.2 CONCLUSIONS

This section presents the conclusion drawn from the discussion of the study outcomes according to the different hypotheses.

5.2.1 Hypothesis One

Hypothesis one in the study stated that, training workshops in ICT networks have a positive relationship with integration of ICT in teaching in Secondary Schools, in the central Region. This hypothesis has generated the following conclusions:

- a) Training workshops in networking plays functional role of introducing teachers to the network of connectivity, enabling them to use the networked system to search information and for communication which was important in fostering ICT integration in teaching in central region.
- **b**) Training workshops were well organized with relevant contents that were beneficial to teachers in enhancing their ability to integrate ICT in teaching.

5.2.2 Hypothesis Two

Hypothesis two was stated that training workshops in maintenance have a positive relationship with integration of ICT in teaching in secondary schools in the central region. The hypothesis raised the following conclusions:

a) That training workshops in computer maintenance enhances teachers' capacity and confidence in using ICT in teaching. Workshops in maintenance were therefore important and, significantly correlated with integration of ICT in teaching. b) Teachers require the possession of skills computer maintenance in order to boost integration of ICT in teaching. Once able to do simple maintenance, they don't need to wait for lab technician to help with computer maintenance.

5.2.3 Hypothesis Three

Hypothesis three of the study was stated that teachers' attitudes towards ICT training workshops have a positive relationship with integration of ICT in teaching in secondary schools in Central Region. The hypothesis raised the following conclusion:

- a) Teachers' attitude towards ICT is important factor for ICT use in teaching. The relevance of ICT training workshops, first and foremost is determined by one's attitudes, which consequently influences their ability to integrate it in schools. Attitude is therefore important in ICT integration in teaching and is a significant positive correlate for ICT integration in teaching in Secondary Schools in Central Regions.
- b) Effectiveness of technology integration in teaching is a behavioral factor that is derived from attitudes. Enhancing ICT integration in teaching in secondary schools in central region demands positive behavioral attitude of teachers that can be created through training workshops hence the need to promote training workshops.

5.3 RECOMMENDATIONS

This last section of the chapter and this dissertation makes some recommendation arising from the findings of the study. The recommendation is made on each hypothesis:

5.3.1 Hypothesis One

Based on the findings on the first hypothesis of the study the researcher recommends that in order to integrate ICT in teaching in secondary schools in central region:

- a) Training works in networking should be encourages and promoted .Workshops on networks should pay special attention to enhancing teachers' capacity to effectively use ICT networked environment (Howell and Lundall, 2000).
- b) Workshop organizers should think beyond just the time spent on training, to training out puts such as efficacy and comfort with networked systems since teachers who are very comfortable and effective are more confident to use ICT in teaching.

5.3.2 Hypothesis Two

On hypothesis two, the researcher recommends that:

- a) Teachers should be trained in computer maintenance if full ICT integration in teaching in secondary schools is to be achieved since such knowledge of maintenance enhances their ability to effectively use ICT in teaching (Breuleux, 2001).
- b) Training in maintenance should focus on areas that aim to reduce computer maintenance cost since this has been cited in past studies as one of the problems to integrate ICT in teaching and yet on the other hand it is cited that increased breakdown of computers is as a result of incompetence of users

5.3.3 Hypothesis Three

Findings on hypothesis three led the researcher to make the following recommendation:

a) If integration of ICT is to be enhanced in Secondary Schools in Central Region then teachers' attitudes should be central target of training workshops.

5.3.4 Recommendation for further studies

Like other studies, this researcher was not all exhaustive in itself; the above recommendations arose from the significant findings of the study. The study therefore cannot finish without pointing out the unfinished work: As observed, the study was limited to a narrow scope of establishing relationships between specified variables in the study leaving out other possible correlates of ICT integration in secondary schools including the variables like financial, administration; infrastructure like Internet cabling, electricity and telephone lines; training content etc. These gaps need to be filled in order to give comprehensive recommendation that can in it be adopted for full integration of ICT in teaching in secondary schools in Central Region in Uganda. Nonetheless the researcher hopes this study has made academic contribution towards establishing some issues significant for ICT integration in teaching in central region; which issues may be generalized (without inferring statistical significance) to other regions.

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APPENDIX A

QUESTIONNAIRE FOR TEACHERS ON ROLE OF ICT TRAINING WORKSHOPS IN INTEGRATING ICT IN TEACHING

Dear respondent,

This questionnaire is aimed at collecting data about the role of ICT training workshops in integrating ICT in teaching in secondary schools in; Kampala, Wakiso, Mukono and Mpigi Districts. Your school was purposively selected and you have been also randomly selected to participate in the study. All information given will be treated confidentially, therefore feel free to avail me with all the necessary information to best of your knowledge.

Thank you,

Ariko Sam
SECTION A: BACKGROUND INFORMATION

- 1. Name of the school
- a. St. Joseph Girls' Nsambya
 b. Mpoma Schools
 c. Bweyogerere S.S
 d. Seeta High School
 e. Kings College Buddo
 f. St. Balikuddembe S.S
 g. St Johns College, Mpigi
 h. City High School

 2. Age

 a) 20 35
 b) 36 55
 c) 55 and Above
- 3. Gender

a. Male

- District
 a. Kampala
 - b. Wakiso
 - c. Mukono
 - d. Mpigi
- 5. Educational level
 - a. Certificate



b.

Female



- b. Diploma
- c. Degreee
- d. Postgraduate

SECTION B: Training in Networks

Indicate your answer your answers by simply putting a Tick ($\sqrt{}$) in boxes provided whereby; **SD**

implies Strongly Disagree, D for Disagree, A for Agree and SA for Strongly Agree.

Item	SD	D	Α	SA
6. I have received good training in networking				
7. I have been trained to troubleshoot network				
problems at work / home.				
8. I have been trained to access useful resources				
from the internet.				
9. I have been trained to send and receive students'				
work on-line.				
10. I can use the knowledge gained from trainings in				
networks to conduct classes using computers				
(on-line).				
11. I have benefited a lot from trainings in networks.				
12. With knowledge of networks, I am able to design				
on-line tutorials for my students.				

SECTION C: Training in Maintenance

Indicate your answer your answers by simply putting a Tick ($\sqrt{}$) in boxes provided whereby; **SD**

Item	SD	D	Α	SA
13. I have received training in maintenance of ICT				
facilities.				
14. I am able to do simple repairs on computers.				
15. If a computer hanged up, I can solve the problem				
without help of a lab technician.				
16. I can easily install programs on computers.				
17. I can easily identify up-to-date my computer software.				

SECTION D: Attitude towards ICT training

Indicate your answer your answers by simply putting a Tick ($\sqrt{}$) in boxes provided whereby; **SD**

implies Strongly Disagree, D for Disagree, A for Agree and SA for Strongly Agree.

Item	SD	D	Α	SA
18. ICT training workshops that I participated in				
were properly organized.				
19. ICT workshops I participated in were adequate.				
20. Training workshops in ICT I participated in				
covered crucial areas I needed.				
21. I welcomed the idea of ICT training workshops.				
22. Programme of training teachers in ICT				

integration is a good one.		
23. Programme of training teachers in ICT		
integration should continue.		
24. Programme of training teachers in ICT		
integration has achieved its aim.		

SECTION E: Integration of ICT in teaching

Indicate your answer your answers by simply putting a Tick ($\sqrt{}$) in boxes provided whereby; **SD**

implies Strongly Disagree, D for Disagree, A for Agree and SA for Strongly Agree.

Item	SD	D	Α	SA
25. I do not find any problem with integrating ICT in				
teaching.				
26. Knowledge in computer networks has greatly				
supported me in teaching using ICT				
27. Knowledge in computer maintenance has				
supported me in teaching using ICT				
28. Training workshops in ICT need to be improved				
if integration of ICT in teaching is to be achieved				
29. Integration of ICT in teaching is the best way of				
improving teaching in secondary schools.				

Thank you for your co-operation.

LETTER OF INTRODUCTION