

**EFFECTIVENESS OF TEACHING COMPUTER STUDIES
SUBJECT IN SECONDARY SCHOOLS IN ARUSHA
MUNICIPALITY, TANZANIA**

**By
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**A Dissertation Submitted in Partial Fulfilment of the Requirement for Award
Degree of Master of Science in Development Policy (MSc. DP) of Mzumbe
University**

2015

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University a thesis entitled **Effectiveness of Teaching Computer Studies Subject in Secondary Schools in Tanzania: A Case of Arusha Municipality** in partial fulfillment of the requirements for Degree of Masters of Science in Development Policy.

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I, Zilpa Gudu Olan'g declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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DEDICATION

I dedicate this work to all strong women who do extraordinary things everyday as if they were ordinary, the unsung heroines. My mother being one of them am privileged to be called your daughter.

LIST OF ABBREVIATIONS AND ACRONYMS

BEd		Bachelor of Education
CS	-	Computer Studies
DP	-	Development Policy
DPT	-	Deliberate Practice Theory
e- LMS	-	Electronic Learning Management System
ELT	-	Experiential Learning Theory
EMIS	-	Education Management Information System
ESDP	-	Education Sector Development Programme
GUI	-	Graphical User Interface
ICT	-	Information Communication Technology
IDS	-	Institute of Development Studies
IRMT	-	International Records Management Trust
IT	-	Information Technology
LAN	-	Local Area Network
MoEVT	-	Ministry Of Education And Vocational Training
NECTA	-	National Examinations Council of Tanzania
UNDP	-	United Nation Development Programme
UNESCO	-	United Nations, Education, Scientific and Cultural Organisation
URT	-	United Republic of Tanzania
USA	-	United State of America

ABSTRACT

This study examined the extent to which teaching of computer studies has been effectively implemented in secondary schools in Arusha Municipality. This study used a survey research design and a total of 140 respondents were involved. Data were collected through questionnaires, interviews, focused group discussion, observation and documentary review. The data were analyzed by using Microsoft excel program and presented in tables, frequencies and pie charts and Content analysis was carried out for the qualitative data. The findings show that most of the schools do not effectively implement computer studies subject, this is because of the challenges they face every day like lack of competent qualified teachers, well equipped computer lab and adequate computers is another challenge, which leads to the challenge of improper method of teaching being used by the teachers. Based on the findings it is recommended that there is a need for raising awareness for this computer studies subject so that students and teachers can take this subject serious. Teacher training and in-service training should be prioritised especially on identifying innovative alternative approaches and smart sustainable solutions to deal with challenges such as electrification, lack of computer and internet. Lastly but not least is the need for monitoring and evaluation to support the development and delivery of computer studies subject in secondary schools. Implementation of the policy ICT Policy for basic education of 2007 by providing a framework for computer studies related programme.

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CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter provided an overview of the problem that was investigated and highlighted the issues of the study. It comprises of background to the problem, statement of the problem, research questions, objectives of the study, and significance of the study.

1.2 Background to the problem

The introduction of computers and computer teaching in secondary schools and its implementation in many countries across the world came about as a result of policy pronouncement and the need to cope with the trend of science and technology (Pearson 2000, Crawford 2000, Kirkman 2000; Mizukoshi, Kim & Lee 2001). Generally, computers do not only play a significant role in the society, but increasingly schools are acquiring computers as an aid to facilitate learning (Guile, 1998). In a similar way, in order for learning to be effective within schools, computer literacy has to be integrated into the curriculum (Richards & Nason, 1999).

This means that computers should not only be utilized as a tool for acquiring skills, but should also be used as a tutor. Taylor (1980) writes that learners use computers in the tutor mode by responding to preset programmes that were programmed by specialists in the field. Good examples of this include word processors and spreadsheets (Heukelman, 1994). To be able to utilize computers in the tutee mode means that the learner should be able to instruct the computer. New instructional techniques that use ICT provide a different modality of instruments for the student, ICT use allows for increased individualization of learning. In schools where new technologies are used, students have access to tools that adjust to their attention span and provide valuable and immediate feedback for literacy enhancement. Implementation of computer studies across the globe has been slow despite the demands for information communication technology (ICT) know how. In advanced countries like the United States of America (USA) they are more advanced in ICT and yet in high schools there is a decline in offering computer studies (Orsborne & Hennesy, 2003) despite its critical and growing

importance, computer science is taught in only a small minority of U.S. schools (Langmia, 2012). African countries still experience a lag in its implementation, and that continues to widen the digital and knowledge divides. A study, by Kiptalam & Rodrigues, (2010), observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries. Eneku & Eneku (2000), states that there is undoubtedly an interest in Computer Studies (CS) at the secondary level, but actual teaching of this content is another story.

There is little evidence supporting the notion that computer science courses, let alone computer training is uncommon in Nigerian primary or secondary schools (Jegede & Owolabi, 2003). In the similar way Williams (2003) adds that such courses and degrees are offered at the university level, but to reach that point of computer literacy takes extra self-motivation and that ICT is still not fully implemented in Nigerian school system as it should.

Furthermore, Tanzania cannot afford to overlook the importance of information and communication technology (ICT) for improved access, equity, quality and relevance of education. In our inter-connected world, knowledge and information are becoming corner stone for the development of a society, as is the ability to communicate. It is our duty to prepare our children so that they can benefit from and contribute to our country's development in the information age (URT, 2007). Introduction and implementation of computer teaching and learning in the schools has been a critical issue that required a clear government policy (URT, 2007). ICT Policy for Basic Education 2007 was established from the National Policy for Information Communication Technology and from this policy every school in Tanzania from Pre-School upwards the pupils are expected to learn computer studies and have access to other ICT infrastructure as simple as a radio in their access.

The country is moving very fast technologically and we have reached at a point where it is incorporated In our system for example application for admission to Higher Learning institutions is done through the internet, without questioning how many of these candidates have prior knowledge of computers or rather do they have access to

this technology? Furthermore, unless action is taken soon, the country will fall further behind in the global information society, be unable to participate in the knowledge economy effectively, and its people will lack the skills they need for life in the digital age. The Ministry is thus promoting the introduction and integration of ICT in the education sector. The major goal is to build a highly skilled and educated workforce with aptitude and skills in the application of ICT in everyday life. For this reason there is need to provide schools, colleges and other educational institutions with the know-how and resources that will include them in the knowledge society (URT, 2007), Therefore this study was set to find out the extent to which teaching computer studies is effectively implemented in secondary schools in Arusha municipality.

1.3 Statement of the Problem

Computer studies subject teaching being integrated in schools in Tanzania is a thing which has captured attention and interest of many people and organizations (Bukaliya, 2012). According to Kalinga (2008), information and communication technology (ICT) have been integrated in education in many developing and developed countries but the use of ICT in Tanzanian secondary school is lagging behind. Due to the current situation of poor infrastructure and resources computer studies has been slowly implemented in urban schools but to what extent, it is not known (Kyafulilo, 2011).

(URT, 2007), it has come to our attention that the introduction and implementation of computer teaching subjects in Tanzania in particular is meant to equip both students and teachers with the valuable skills and knowledge about the practical application of computers by integrating computer knowledge into the educational curriculum.

It was therefore, the efforts of the Tanzania's government to ensure the availability of all such necessary facilities as computer hardware and software, personnel, reliable power supply and the infrastructures to make easy for the implementation of the programme. Despite such efforts Swarts and Mwiyeriya (2010) indicate that the computer teaching concentrates on big cities like Dar es salaam and therefore the trend on the effectiveness of the programme in secondary schools on the other parts of the

country is still not openly known. Hence, the study on the effectiveness of teaching computer studies subject in secondary schools in Arusha municipality, Tanzania.

1.4 Research questions

1.4.1 Main Research Question

Has the teaching of computer studies been effectively implemented in secondary schools in Arusha Municipality?

1.4.2 Specific research Questions

Specific research questions were as follows:

- i. What is the status of computer studies teaching in Arusha
- ii. Are there qualified teachers to teach computer studies subject?
- iii. Are there enough required equipment and infrastructure for teaching computer studies?
- iv. Is there relationship between methodology used to teach computer studies and effective teaching?

1.5 Objectives of the study

1.5.1 Main Objective

The main objective of the study was to examine the extent to which teaching of computer studies has been effectively implemented in secondary schools in Arusha Municipality.

1.5.2 Specific Objectives

Specific objective were as follows:

- i.To find out the status of computer studies teaching in Arusha
- ii.To assess the capacity of staff to teach computer studies subject
- iii. To find out the status of equipment and infrastructure for teaching computer studies
- iv. To explore the relationship between methodologies used to teach computer studies and effective teaching?

1.6 Scope of the study

This study was conducted in Arusha Municipality. It concentrated effectiveness of computer studies in secondary schools within the municipality that teach computer studies subject. It specifically looked at the status of computer studies subject, the capacity of staff to teach computer studies subject, the status of the equipment and infrastructure and lastly the methodology used to teach this subject. Respondents were drawn from within the municipality.

1.7 Significance of the Study

The research findings will be beneficial to Arusha municipality since it will provide useful information about this programme of teaching computer studies. The study will also increase awareness to secondary schools and other ICT stakeholders available in the area on the situation of effective teaching of computer studies that can increase positive action towards meeting the education goals of the students. Also, the findings of this study will be useful to education officers, school inspector and other change agents in regards to improving the programme to achieve effectiveness. To teachers teaching computer studies subject, this study through its guiding theories: Deliberate Practice theory and Experiential learning theory, will be informed of what it takes to teach computer studies subject effectively. Furthermore, the findings will provide useful knowledge to the government and its agent, policy makers and other implementers on the effectiveness of computer studies subject teaching in secondary school.

1.8 Limitation

In the process of this study some limitations did arise. First, some of the interviewees especially students were reluctant to expose the real condition of computer studies teaching in their school. Furthermore there are few schools that teach computer studies subject in Arusha Municipality. Second, documents about the use of computers in education in Third World countries were few but notably from First World countries such as United States of America, Norway, the Netherlands and Great Britain. Time and financial difficulties also affected the researcher during data collection. To solve this problem first, the researcher tried as much as possible to persuade the respondents

to be confident with the researcher so as to provide information readily. Second, the planned more than one activity in one visit to a school so as to curb financial and time constrain.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter explores the theories, the concepts and explains the current state of the knowledge in the study topic. The first section looks on the meaning of the terms and the second section presents the review of empirical literature

2.2 Theoretical Literature Review

2.2.1 Definition of Key Terms

The major concepts defined include computer, computer studies, computer literate and ICT

2.2.1.1 Computer, Computer studies, computer literate, ICT

Computer: According to the International Records Management Trust (IRMT) (1999), a computer is a programmable machine. It allows the user to store all sorts of information and then ‘process’ that information, or data, or carry out actions with the information, such as calculating numbers or organising words.

Computer studies: For the purposes of this document, the term *computer studies* refers to the study of computer science, meaning computer and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society. The major focus of these courses is the development of programming skills, which are important for success in future postsecondary studies (URT, 2007).

Computer literacy refers to the ability to use computers at an adequate level for creation, communication and collaboration in a literate society (Guile, 1998).

Information Communication Technology (ICT): ICT has several definitions depending on the nature of its use, but for this study ICT is used as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications associated with them, such as

videoconferencing and distance learning URT (2003),. We refer to ICT in the particular context of ICT provision, policy and teacher factors that variously support teaching, learning and a range of activities in education. It is from this explanation that the Ministry of education and Vocational Training upon integrating ICT into school call it computer studies.

2.2.2: Quality, equality education in technology

Every human being has a right and an equal opportunity to not just education but quality education and that's why the policy of ICT for basic education is directed at the achievement of the objectives of Tanzania's education policies and education development programs, (URT, 2007). Education policy of 2014 stated that the overall aims of education in Tanzania are among other things:

“To promote the acquisition and appropriate use of literary, social scientific, vocation technological, professional and other forms of knowledge, skills and understanding for the development and improvement of man and society”.

In 2001, the Education Sector Development Programme (ESDP) was launched to realize the objectives of education policies by addressing critical issues including ICT, improving equality the quality of education, both formal and non-formal; to promote access and equity to basic education to promote science and technology. Furthermore, Article 26 of the Human Rights Declaration states “The concept underpinning human rights education is that education should not only aim at forming trained, professional workers, but also at contributing to the development of individuals who possess the skills to interact in a society. Human rights in education, aims at providing pupils and students with the abilities to accompany and produce societal changes. Education is seen as a way to empower people, improve their quality of life and increase their capacity to participate in the decision-making processes leading to social, cultural and economic policies”.

According to Fiske (1992), If we are talking about empowering an entire community – parents, teachers, administrators, even students – then they all need access to newest technology, otherwise we are trying to prepare students for the twenty first Century

world using Stone Age tools. Noll (2001), support that Advocates of Information Age education will again point to the precedent of the printing press and the great democratization of education that followed. Just as the printing press brought high quality and affordable education to the masses, new educational technologies should do the same. By reducing the cost of access to the best instruction in the world, these new technologies if properly implemented should decrease the discrepancy between the information haves and have nots.

According to Riordan (2004), In democratic societies citizens demand both greater equality and greater quality from schools. They desire both the simple transmission of basic knowledge and skills and selection of certain students to pursue specialized and functional roles in society, but also our society demands equity and equality of educational opportunity for all citizens.

UNESCO's World Conference on Education for all, held in Jontiem in 1990 and from the Global Forum on Education, held in Dakar in 2000. According to these recommendations, it is not the enrollment of a certain part of the population, in other words access, that fulfils the right that all have to education. Education for All refers to an education capable of serving all children, youths and adults with the required quality and equity. Improving the quality of education, keeping students in school and expanding access to education are among the major challenges currently faced by countries. Such challenges are associated to the increasingly important role played by education at a global level, because of its relevance to the pursuit of sustainable development in society, citizenship awareness building and the fight against social exclusion. The development of public policies based on those perspectives is a core strategy to ensure the universalized access, attendance and learning at all stages of basic education.

Jensen (2003), Technology-based learning has the potential to facilitate development of students' decision-making and problem solving skills, data processing skills, and communication capabilities. Through the computer, students may gain access to expansive knowledge links and broaden their exposure to diverse people and perspectives; hence, affording students the opportunity to become active participants in

an increasingly global and interactive world. The technological shift in society has occurred very rapidly, and the field of education is attempting to keep up the pace. Recent advances now allow computer technology to serve many more functions for the social studies classroom than merely accessing information through the Internet (Berson, 2003)

UNESCO/COMSCE, (1992). Affirms that everyone, in their daily lives, comes into contact with science and technology. People who cannot use and understand the available technology are left behind in development and in the competition for survival both as individuals and as nations. But it is more than that. The youth also have to prepare for the technologies of tomorrow and the development that result from these technologies. 'The world we live in is dominated by change related to development and the pace and volume of change is constantly increasing because science and technology'. Today's young people must keep up with this change; they must be prepared for technology that has not yet been invented, and be able to design solutions to problems that do not yet exist According to Farrant (2004), he emphasized on the use of technology in schools, he said "technology in education is increasingly recognized as essential part of teaching and therefore now finds its place in the curriculum"

Farrell (1999) points out that schooling is a long-term process in which children may be sorted at many different points and in several different ways. Thus schooling operates as a selective social screening mechanism. It enhances the status of some children, providing them with an opportunity for upward social or economic mobility. It also ratifies the status of others, reinforcing the propensity for children born poor to remain poor as adults, and for children born into well-off families to become well-off adults. Studies on postcolonial education in sub-Saharan Africa reveal that schooling has been a mechanism for perpetuating these/such social inequalities.

According to Farrell (1999) the term "equality" refers to equitable service provision as well as the actual patterns in which something (e.g. income or year of schooling) is distributed among members of a particular group. When the concept is applied to public policy, "equality" has to do more specifically with non-discrimination Farrell conceptualizes "educational equality" as encompassing four dimensions including

equalities of access, survival, output and outcome. He defines equality of access as the probabilities of children from different social groups getting into particular levels or portions of the school system. He applies this concept to the inequalities in the distribution of educational resources. He posits that most children residing in remote rural areas, those in urban slums, and those belonging to groups outside of mainstream society are disadvantaged when it comes to the distribution and access to educational resources. Farrell defines equality of survival as the probabilities of children from various social groupings staying in the school system to some defined level, usually the end of a complete cycle. He explains that in any given level poor children are generally less likely to survive educationally than are well-do-to children. Similarly, children born in rural areas are less likely to survive educationally than urban children. Equality of output refers to the probability that children from various social groupings will learn the same things to the same levels at a defined point in the schooling system.

The concept is expressed through differences in the level of achievement in nation's school system which Farrell points out as systematically associated with differing social origins. He points out that among those who have reached a given level of nation's school system, children who are poor, rural, female, or from any other socially marginalized groups learn less. Equality of outcome refers to the probability that children from various social groupings will live relatively similar lives subsequent to and as a result of schooling. Here too, Farrell posits that in societies where the economy is expanding, and where there is no dominant group in the society, formal education becomes a predominant influence on the level of employment acquired.

For effective teaching of computer studies subject it is important that equality in education be considered to make this subject accessible to every secondary school in Tanzania. This can be achieved by overcoming barriers like lack of electricity and computer for schools in the rural Tanzania. Quality education to achieve successful teaching of computer studies subject is through having proper equipment and infrastructure in all of the secondary school. This can be achieved through ESDP putting in place a policy frame work that can realize the effectiveness of this programme

2.2.3 The significance of computers in school

Although teaching computer studies is seen as essential in the world today, the significance of computers in schools needs to be examined. Many schools and other educational organizations are investing heavily in computer technology and teaching in both developing and the developed countries (Chapman, 1998)

One of the advantages of teaching Computers studies and its knowledge are to transform communications and the economy (McMahon, 1990). It is also of great importance that every child should be exposed to this technology so as to understand the significance of this technology. (Roszell, 1995), Every high school student should know how to use a computer and the Internet, understand how a computer works, have some grasp of how to find information on the Internet, and generally know how computers are used by the businesses, the government, educational institutions and people in their homes. As stressed by Palfrey & Gasser (2008), at a bare minimum, students should know how to type, how to use a word processing application because this is the generation of the digital natives that lives by and in the digital

2.2.3.1 Teaching computer studies for learning and for the future in an industrialized society

Another significant part of teaching computers education in secondary schools is for teaching and learning purposes. And this is referred to as the pedagogical and catalytic rationales for equipping the students with the necessary skills in technology to make a significant contribution in an ICT rich world and careful consideration should be given to how to integrate computers into teaching and learning (Yagi, 1996). The teaching of computer technology to students and children can advance high order thinking skills such as comprehension, reasoning, problem-solving and creative thinking and enhance employability.

Furthermore, the teaching and the implementation of computers in secondary in this way relates to the social and vocational significances. For the sake of making good preparations for the students in schools for the purpose of matching with the digital era, most of the governments across the world are spending significant amount of money on the teaching and implementation of computer studies in all the levels of schooling. The

ICT policies are developed and the schools are provided with computer hardware and software as well as Internet connectivity. Leask & Meadow, (2000), contend that it is still evident today, where governments monitor the implementation of computer studies in schools on a regular basis in order to enhance the teaching of computers in those schools. This is done so purposely to prepare the smooth path for pupils of being more productive future workers in the information communication and technology in the globalised world

2.3 Factors for effective computer teaching in secondary schools

The effective teaching of computer studies in secondary schools and its implementation worldwide gives rise to another important puzzle as to what could be the significant factors that would influence its effectiveness (Morton, 1996 ; Pelgrum, 2001). It has been observed that there are a good number of factors which when carefully handled down will help in making the computer teaching smooth, effective and interesting. Therefore some of these factors include the availability of trained and qualified personnel to teach the students, the availability of the equipment to be used by both teachers and students during the process of teaching and learning, a well established infrastructure to support the teaching and the last one is the availability of reliable source of power. When these factors are put in place the computer teaching program will always be successful.

2.3.1 The availability of trained and qualified personnel

One of the important factors influencing computer teaching in secondary schools is the availability of well qualified and trained computer teachers. It seems however the majority of teachers in schools lacked computer training and a few of them had some sound working knowledge of computers, Taylor (1980). Stallard (1998) established that the handwritten comments to his research instruments by teacher respondents overwhelmingly expressed a need for teacher training on basic computer skills and that training should not be limited to teachers who teach computer education. He adds that the need for an international trend on the part of educators to train all teachers on the use of computers and the pedagogy of teaching computers in the curriculum is a

necessary thing because a delay would bring more harm to the teaching of computer studies and more seriously on its implementation.

Therefore insufficient and unqualified teachers in our schools will not only affect the students' learning but also the program itself which will make it difficult for the graduating students to compete in the labour market. This need for teacher training is explained by the fact that most of the currently employed teachers have little or no training in their formal education (Warschauer, Knobel & Stone, 2004). It could also be a reflection of the need to update teachers' knowledge in the world of fast moving technology of communication. Training all teachers on the educational use of computers is of special importance when considering integrating the computer into the regular curriculum. Teachers need to have enough knowledge on the use of computers first before they can teach their students in the schools they come from.

Also most teachers even those trained to teach computers in schools are reluctant to do so which could be associated by the limited experience with software and hardware as part of the important component in teaching computers to the students in schools. As, Stevenson (1997) say the qualifications of the majority of the teachers are far from being satisfactory due to lack of exposure to college curriculum that does not cater for ICT training. The teachers have poor practical skills in ICT usage since the majority of them could not even use the basic software in computers for the delivery of their lessons and indications are that the teachers lack the necessary skills and knowledge of computers in basic software usage.

Generally, the teachers who should be teaching computer studies in the secondary schools should be able to apply computer knowledge well for various purposes. In this way it will be possible for them to manage the computer classes they are given and being capable of helping the students.

2.3.2 The personnel Attitudes on Computer teaching

An attitude is a feeling towards what one does. Therefore teacher attitudes toward computer teaching are a significant factor in the implementation of computers in education (Mackenzie, 1993 & Mackenzie, 1991). A negative attitude by the teachers

toward teaching computers in schools tarnishes the whole picture of the program because they could not do it properly as they have developed hatred against it. But for the positive attitude that most of the administrators would like to see in teachers that will make a great contributions for the success of this program, however, the attitude of teachers go hand in hand with the level and ability to teach the computers in schools as what Brand (1998) express a concern that computer literate individuals will reap greater benefits than their counterparts who lack that knowledge. Their concern is that the development of computer literate individuals is dependent on computer literate teachers who have in general demonstrated a resistance to learning about computers.

A more recent study by Newhouse (1995) found that some teachers do not believe that computers have a useful educational objective and that they are nonessential and supplemental to their teaching and classrooms. A review of literature on teacher attitudes towards computers and teachers' perceptions of computers, the impact of computer use and the impact of personal and learning environment characteristics affecting a teacher's intention to use and teaching computers in their schools. In maintaining the positive attitude of the teachers and for effectiveness of the teaching of computer studies in secondary schools it is important that the above mentioned factors are dealt with.

2.3.3 Instructional Time

In order to teach computer studies effectively in our schools time is one of the important factors. The time factor surrounding the implementation process is viewed by teachers as could be a constraint or a loop hole for teaching and using computers for both teachers and their students in schools. The important thing that is considered in the amount of time the schools give to the teachers and students for teaching and interacting with the computers. Stallard (1998) and Mackenzie (1993) indicate that the more the time given for computer teaching and application the more practical both teachers and students become.

Therefore it is important to note that for the teaching of computer studies to be effective anywhere in the world there must be enough time for the teachers and their students to interact in the classroom instructional time and then the individual teachers and the students get time for their practical. Therefore if this is successfully conceived computer teaching in secondary schools will be perfectly taught by our teachers. However, Solomon (1995) contends that teachers face potential interruptions during teaching computer studies like, fixing and troubleshooting computers instead of teaching hence it reduces instructional time.

2.3.4 The role of equipment in computer teaching

Human lifestyles have undergone a big change with the advancement in several technologies including computers (Jankowski, 1996). Computers are an integral part of our lifestyles today and are found at offices, homes, schools, colleges, hotels and shops. This advance in technology has made our lives easy and comfortable. For instance, we can execute a number of activities using computer-based programme, we can write a draft on word processor and email it, make calculations using an electronic spreadsheet and incorporate graphics, create a database of friends with their phone numbers, addresses and e-mail ids. It is a difficult and tiring process to perform these activities using existing traditional methods.

Further, the computer systems are divided into hardware and software which are both very important for facilitating computer teaching studies in schools. For the case of hardware they include all the physical parts of the computer system. For example the monitor, key board, the mouse, the speakers and webcam, these enable both the teachers and the students interact with their computers during the teaching and learning process. While software part contains the instructions which when the user apply them can instruct the computer what to do.

Therefore for effectively teaching the computers in schools the schools need to have these equipment and at the required number. If the numbers of computers are less than the number of the students then the ratio is bad hence the students will benefit theoretically and will remain poor in the practical part of the computer. If the situation is so then the program will be considered ineffective but if the number of students

concur with the number of equipment available and the students have learnt then the program is said to be effectively taught and implemented. Thus, these two could also be considered as the important parameters in assessing the effectiveness of computer teaching studies in secondary schools. In order to meet the expectations in the teaching of computer or any other program the preparations and having equipment for the project is of paramount necessity.

2.3.5 The schools' infrastructure and computer teaching

The teaching computer studies in secondary schools and the infrastructure are considered two things that work together for the same goal (Blease, 1996). The effectiveness of teaching computer studies depends also on a well established infrastructure including building and other services. However, the building needed by the schools and other institutions are classified as the ordinary class room where the theoretical part of the teaching computer studies could be conducted. These are supposed to be at the required standard that it should have enough space to allow the students to be accommodated comfortably. And the second part of the computer teaching building includes the computer laboratory. This is a special place in a school where the computers and all other devices are fixed. It is also a place where practical or the application of the knowledge of computer can be utilized. Therefore in this building the students are exposed to the real knowledge of computer application using both computer hardware and software.

According to Stallard (1998) the computer laboratory is the heart of effective teaching of computer in schools. If the students do not see and try to practice its use the claim of teaching this program in our schools across the world becomes invalid and useless. Therefore the important thing to deal with at the planning stage is to see the possibility of getting both the building together with the facilities that will make the teaching and learning computers meaningful.

2.4 Theories on Effective Teaching

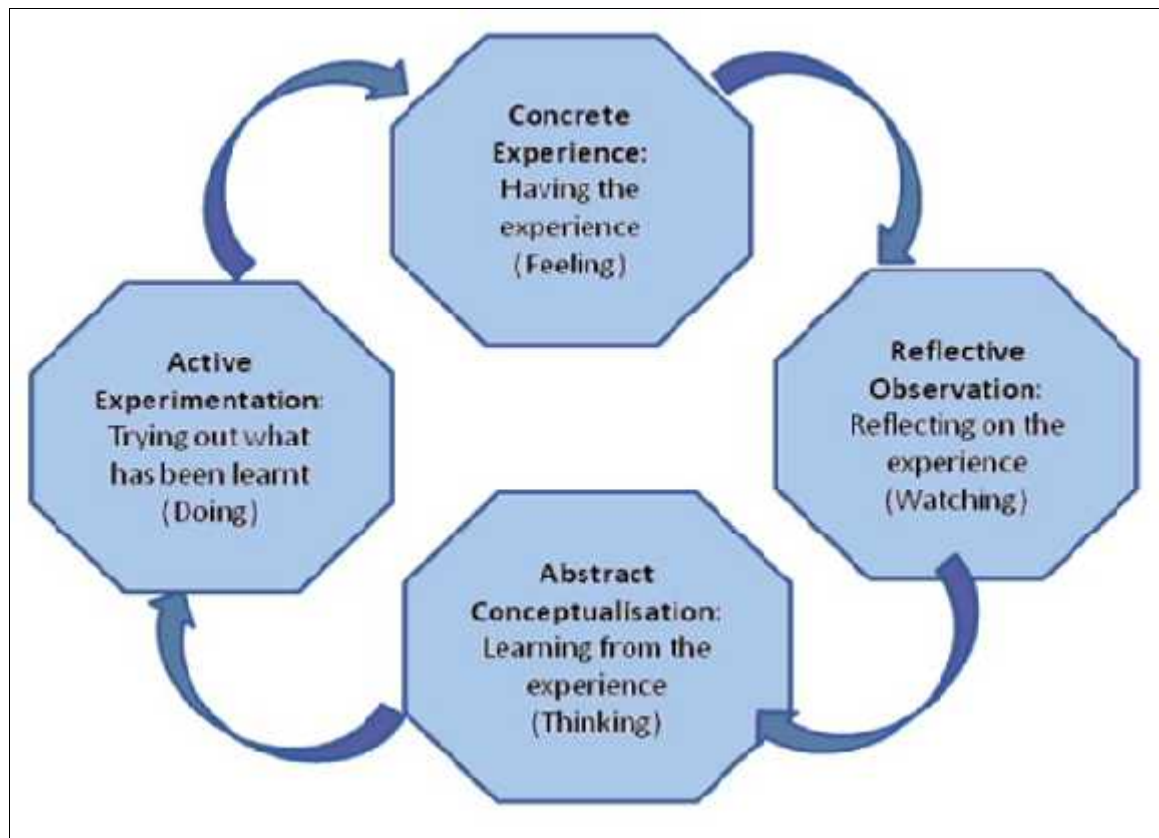
Experiential Learning Theory (ELT) (Kolb 1984) and Deliberate Practice theory (Ericsson 1993) guided the study.

2.4.1 The Experiential Learning Theory (ELT)

Experiential learning is a process of making meaning from direct experience (Kolb 1984). The basis of all experiential learning is that experience matters and that learning process is focused on an individual. According to Kolb (1984), knowledge is continuously gained through personal and environmental experiences. In ELT students are encouraged to acquire and apply knowledge, skills and feelings in an immediate and relevant setting. ELT is a holistic perspective on learning that combines experience, perception, cognition and behaviour, this is especially important especially in the teaching/learning computer studies. In learning a new skill is very important for the learner to have the chance to learn through experience as it enhances their chance of understanding the new skill and concepts associated with it. Focusing on the learning process as Kolb presented for effective learning an individual in the case of this study that is a student has to go through four stages which are; concrete experience, reflective observation, abstract conceptualization and active experimentation.

The ELT theory implies that for the student to get concrete experience there has to be proper environment that support teaching computer studies effectively in secondary schools. A computer class or laboratory has to have enough computers for the students, enough text books, availability of internet connection, above all a qualified teacher. In this stage the students are in the class *doing* learning not *listening* learning. In reflective observation students learn by observing either the facilitator (teacher) or fellow students how to perform different computer instruction. The student will then have a chance to think about what has just taken place this according to Kolb is abstract conceptualization and lastly active experimentation. In the active experimentation the students has the concept and can plan on how and when to precisely use that knowledge. Then the cycle is completed when the student does apply what they have just done. In ELT learning is done in chunks that is the facilitator plans short practical lesson, for example for the first day of class for form one the teacher can teach about the graphic user interface (GUI), how different symbols of button work to process different commands for example the start button and the status bar.

Figure 2.1: Experiential Learning Cycle



Source: Kolb (1984)

2.4.2 Deliberate Practice Theory

Deliberate Practice Theory (DPT), is categorized as an activity designed to improve specific aspects of performance as is often rated as a more challenging more effortful and less enjoyable (Ericsson 1993). According to Ericsson people with outstanding promise will find a coach capable of helping they arrive at each level of expert level. For Ericsson (2002), these activities are characterised by specific goals that take a person beyond his or her capacity in the domain, extended periods of intense activity, the promotion incremental improvement in the domain, and the use of mentors to offer critical feedback. Immediate and informative feedback must be made available via the practice activity, and this feedback must be received and attended to in order to make accurate adjustments and correct errors, leading to the improvement of performance on the repeated tasks.

This theory in this study relates to the means of how and what should be done to achieve effective teaching of computer studies in secondary school. Computer Studies subject develops skill for learners and this skill cannot be achieved solely by being lectured or observing the teacher doing, this subject requires the students to do actions while learning. Furthermore, just doing activities during the forty minutes or eighty minutes is not enough, it takes a lot of many hours of practice to familiarise oneself with the computer. This means that students to have access to a computer laboratory which is opened all the time and a teacher available in the lab during the school hours so that students can have access to computer and not only that but as Ericsson suggest during practice students need a mentor (teacher) to offer critical feedback and offer support to students where they need. Students without having enough practice and support it will be difficult to achieve the effectiveness of this programme.

2.5 Empirical Literature Review

Prince (2007), did a study in South Africa on how the practice of computer studies suggest the implementation of computer studies in local secondary schools. The findings of revealed that two out of three schools were not utilizing their computer effectively because computer studies subject was not integrated into the curriculum.

HAKI ELIMU (2011), conducted a study regarding teaching of computer studies and quality education in both primary schools and secondary. This study was done in Kahama and Nkasi district. The study revealed that there was a shortage of qualified teachers and facilities that support teaching of computer studies subject; hence schools in these districts opted not to teach computer studies.

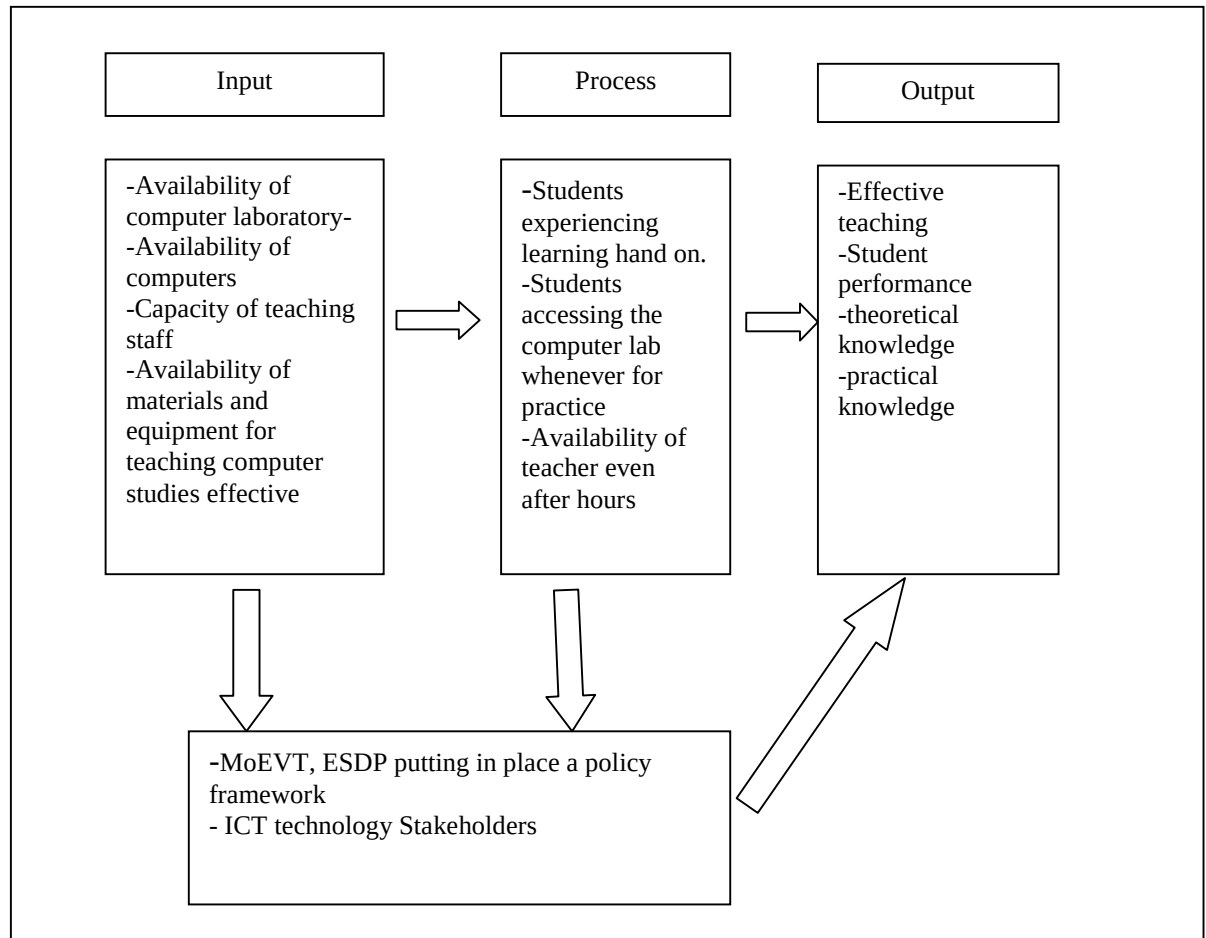
According to the Ministry of Education Kenya (2006), opportunities for realizing the benefits of using ICT in education face a number of challenges in the developing countries. Access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries. In Kenya, the ratio for universities and colleges is 1:45 while access at the primary school level is much more limited at 1:250.

From these studies it was clear that computer studies was not effectively implemented because of lack of qualified teachers and facilities (Haki Elimu 2011), and poor implementation of computer studies since it was not integrated in the curriculum (Prince 2007). This problem was not only limited to these studies hence studies in other regions like Arusha were important.

2.6 The Conceptual Framework

Figure 2.2 presents the conceptual framework that was adopted in conducting this study. The effectiveness of teaching computer studies subject in secondary schools was examined through the Input Process Output model. The Input factors that may affect the programme effectiveness are; availability of computers, the capacity of the teaching staff, availability of computer hardware and software and the teaching methodology. The Process consists of how frequently the students attend laboratory sessions where they can experience learning through hands-on learning. Furthermore, in the Process stage this study examined whether students have a chance to attend the lab at their own free time to practice. The results of this model are the Outputs which in this study include the knowledge and skills gained by the students hence in the long run the effectiveness of teaching computer studies in secondary will be achieved, (Russ, Bobber, Teja, Foxon, and Koszalka 2008). The intervening variables in this study are the Ministry of Education and Vocational Training (MoEVT), Education Sector Development Programme (ESDP) through policy framework which determines whether the program has been effectively performed or not.

Figure 2.2: Conceptual Framework Input Output Model



Source : McGrawth 1984

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presented the study area, the research design, the sample size and sampling techniques. It also describes methods of data collection and tools, data processing and analysis, reliability and validity issues of the study as well as how ethical issues were addressed.

3.2 Research Design

The research design is the arrangement of conditions for collection and analysis of data. It is the conceptual structure within which the research is conducted (Kothari, 2004: 31). It is a blue print of a research study on decisions regarding what to be studied, where to conduct a study, when to conduct a study, and how much data to be collected and by what means. Since this study needs deep investigation, contextual analysis of the situation in question, for the purpose of validating the study and considering different viewpoints about this study.

This study used a survey research design. School survey was utilised because it facilitated in collecting a large amount of data from a sizeable population. A school survey research design provided guidance for a comprehensive study of existing educational conditions undertaken to determine the overall effectiveness of the school programme with a view toward improvement where indicated (Singh, 2006).

3.3 The study area

Arusha is one of the municipal in Arusha region. It is located in the north-eastern part of the country, at the foot of Mount Meru. Perched at elevation of 1500m above sea level, Temperature The dominant climate is cool and wet Arusha city has a mild climate, temperatures with Annual average of 20 degrees Celsius; March to May is normally the start of the rainy (and cold) season in Tanzania. The hottest period extends between November and February between May and August usually the coldest months (15–20°C).

Rainfall

Arusha has two rainy seasons, the short and the long rainy seasons. The short rainy season (Vuli) is from October to November and the Long rainy season (Masika) from April to May. In Arusha, most areas get rainfall of at least 250mm per year. The amount of rainfall is about 250mm to 1,200mm.

Arusha city has the population of 341,155. It is a manufacturing centre, the processing and shipping hub of a region in which minerals like tanzanite, cash crops like wheat, , and coffee are produced. Arusha also serves as a tourist gateway to Olduvai Gorge and the scenic national parks of northern Tanzania, Serengeti, Manyara, and Ngorongoro.

Profile of Arusha Municipality

Roads

Arusha municipality has a road network that covers the main districts and townships. Roads are generally passable throughout the year, although four wheel cars are recommendable and certain areas experience obstacles of passing during rainy season. Nairobi, the capital of Kenya and Arusha is linked together by a well maintained road through the border town of Namanga.

Power and water supply

Arusha municipality is served by the National grid from the major hydroelectric power plant in Morogoro region further south. Arusha municipality enjoy a get their water supply from different spring and river sources.

Forestry

The region also boasts of good forest land covering about 2555 sq KM forest reserves covering 133.444 ha with a total annual wood capacity of about 2 million c u-meters. These forests give a natural support to the ecosystem and provide a boost to a hospitable environment.

Industry

The major industrial activities in the region include textile, tire manufacturing, home use products, electrical equipment, pharmaceuticals, phosphate processing, beverages, food and fruit processing.

Wildlife and Natural attractions

Arusha municipality is endowed with very rich resources in terms of wildlife. It comprises some of the Momela National parks, and of course a gateway which host Serengeti, Lake Manyara, Ngorongoro Crater, Tarangire.. The rich cultural heritage of the Maasai people in the region offer another unique experience.

Agro economic zones:

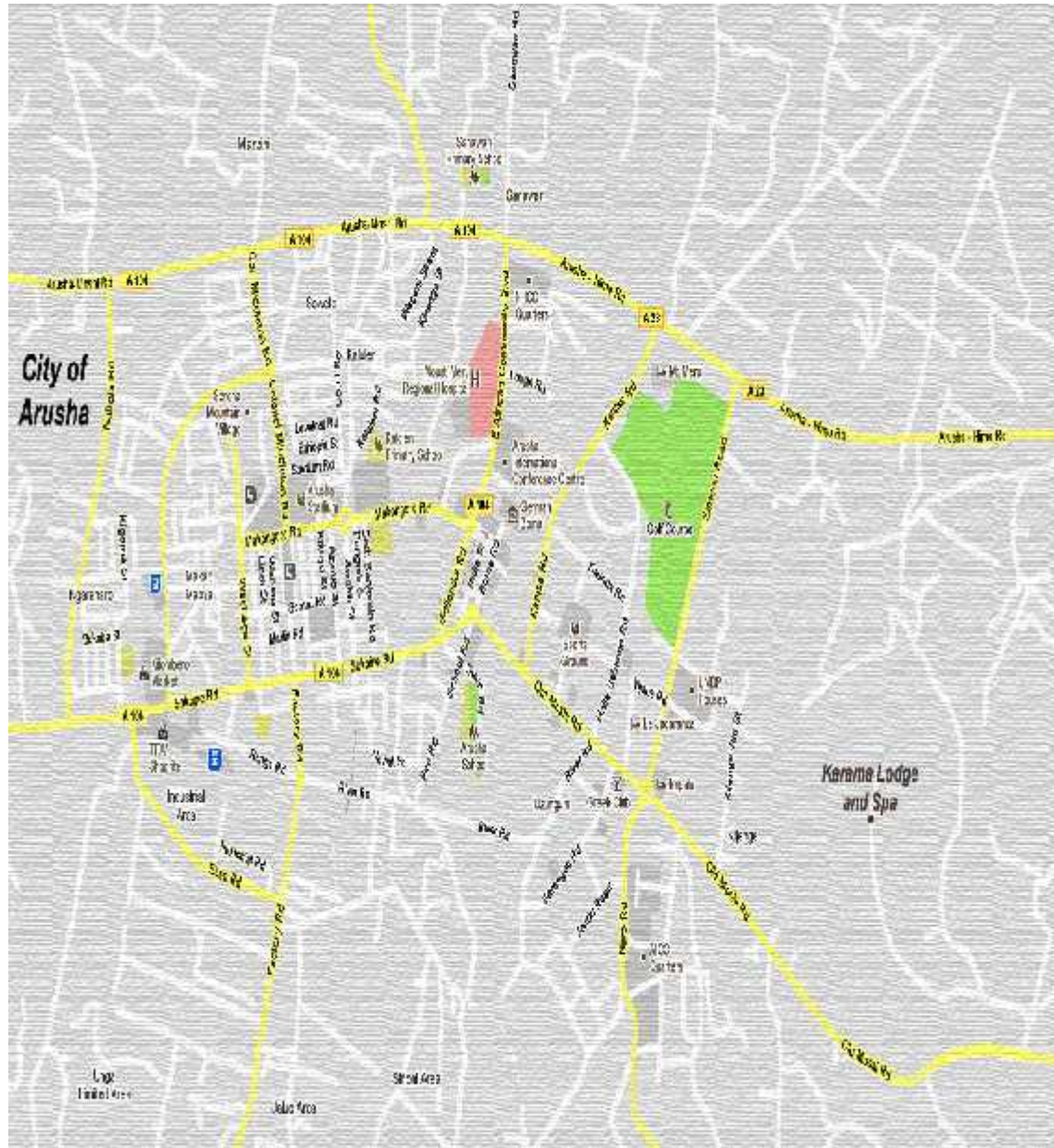
Arusha municipality comprises a variety of land characteristics. Therefore the land has been classified as follows: Arable land: 2,472,940 ha under cultivation 520,130 ha. Irrigableland 59466 ha. Unexploited land: 38000 ha. Banana /Coffee Zone, This zone is mainly highland with some lowland towards the South of the district enjoying rains of over 1000 mm annually. The population density is very high. A fairly high income refers mainly from crops as coffee, vegetable, fruit and banana. Large scale farming is picking up in horticultural activities and dairy farming within this zone due to conducive climate condition.

Ranching

The climatic condition provides an attractive environment for ranching activities. which include cattle, sheep and birds like ostrich, and processing of the livestock products. There is a small market that has all opportunity to involve further investments in this area.

Arusha municipality has a total of 43 secondary schools, where 23 are owned by the government with 20305 students, and 20 secondary schools owned by private sectors with 4262 students. (DEO Academics, 2012)

3.4 Map of Arusha



Source: Google Map (2014)

3.4.1 Target Population

In this study the beneficiaries are all secondary schools in Arusha Municipality who were the targeted population. The term population refers to all elements, individuals or units that meet the selection criteria for a group to be studied, and from which a representative sample is taken for detailed examination (Bowling 2002).

3.4.2 Sample size, and Sampling techniques

A total of 140 respondents were involved in the study. Systematic sampling of ten respondents from each class from each school; where every 5th or 10th member in the population was selected to participate in the study. For example for a sample of 30 students from a population of 150 students, one student was selected as a respondent per every five students to participate in the study. However, in case of Arusha Modern and Jafary school classes were of less than a hundred students simple random sampling was applied

Table 3.1: composition of the Sample

Category of respondents	No. of respondents
Academic Masters	4
Computer teachers	6
Other teaching staff	6
School inspectors	3
Student	120
Total	140

Source: Field survey data (2014)

3.5: Types of data

Data means the values of qualitative or quantitative variables, belonging to a set of items. This study used both primary and secondary data: The primary data is the data collected during research from the field and for the first time, and thus happen to be original in character. The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process (Kothari, 2004).

Primary data was obtained from the teaching staff, education school inspectors, students and computer teacher. Data collection tools like interview, questionnaire, observation and focus group discussion and testing were used. Secondary data were collected from published and unpublished documents which are reports, ICT policy for basic education, computer studies syllabus for secondary schools, books, and other relevant information concerning teaching of computer studies subject in secondary schools

3.6: Methods for data collection

Data collection was done by using the following methods: questionnaire, interview, focus group discussions (FGD), observations and testing for primary data, and documentary review was used to collect secondary data

3.6.1: Observation

Observation is the basic method of getting into about any event. It becomes a scientific tool for research when we use observation in a systematic manner with a scientific attitude. Observation becomes a scientific tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability (Kothari, 2004). In observation the researcher goes to places where the event is taking place and records the findings. The technique is independent of respondent's willingness to respond, as such in relatively less demanding of active cooperation on the part of respondents. It is, because the researcher observes directly issues going on in the field relating to the research problem without asking from the respondents (Kothari, 2004). Observation method was as well applied to recording verbal answers to various questions. The study had to prepare observation schedule, with the concerned teacher. Being in the computer laboratory the researcher confirmed the number of computer hardware, software and books available, also observed as the students were using the computers for example typing, opening and closing various programmes, all these activity were photo captured.

3.6.2: Questionnaire

Asking questions through questionnaires is another way of collecting both quantitative and qualitative data from people. Using a questionnaire enables the organisation of questions and receive replies without actually having to talk to every respondent (William, 2000). As a method of data collection, the questionnaire is a very flexible tool, they are cheap to administer and they can be quickly to administer. They are an easy way to question a large number of cases covering large geographical areas, the personal influence of the researcher is eliminated, embarrassing questions can be asked with a fair chance of getting a truthful reply, and they are convenient for respondents.

The respondents have time to check facts and think about their answers, which tends to lead to more accurate information. For this study structured questionnaires were used to get systematic answers from the students who questionnaires were administered to

3.6.3 Interviews:

The main purpose of the interview in this study was to elicit responses from the interviewees by directing questions to them. Interview is a conversation between two or more people where questions are asked by interviewee to elicit facts or statements (Kothari, 2004). This method was applied teacher, education school inspectors. This research made use of semi-structured interview schedules (Cohen, Manion & Morrison, 2000). Furthermore, by means of open-ended questions, the researcher got an in-depth understanding of the responses of the participants (Berg, 1998). The researcher obtained a wider perspective of the issues regarding the implementation and integration of ICT in schools. It is a flexible means to obtain data from the respondents, since the face-face situation lends itself easily to questioning at greater depth and in detail (Tayie, 2005)

3.6.4 Documentary Review

Documentary review involves the use of texts and documents as source materials: government publications, newspapers, certificates, census publications, novels, film and video, personal photographs, diaries and innumerable other written, visual and pictorial sources in paper, electronic, or other 'hard copy' forms (Scott, 2006). Documentary review is major types of social research and arguably has been the most widely used in the history of sociology and other social sciences. It has been the principal method - indeed, sometimes the only one for leading sociologists. In this study, documentary review was the major source of secondary data. This method was used to get background information and literature reviews (Altschuld & Witkin, 1995).

The researcher requested and read the existing documents from the (public academic publication), ICT Policy for Basic Education, Ministry of Education and Vocational Training, District Educational Offices and the annual reports, from selected schools aimed at collecting data relating to the topic of study. Textbooks were used to see the content if matches the syllabus. Many times the information required to complete a

study has already been collected by others. hence, document review process provides a systematic procedure for identifying, analyzing, and deriving useful information from existing documents.

3.6.5: Focus group discussion

Focus group discussion is small number of people, usually between 4 and 15, brought together with a moderator to focus on a specific topic (Kothari, 2004). In this study the size of focus groups ranged from 10-15 students from each secondary school involved in the study. The purpose of adapting this technique in the study was to draw upon respondent's attitude, feelings, experience and reactions in a way which would not be feasible using other techniques. This method or technique is useful for exploring attitudes, ideas, concepts and perceptions or feelings towards certain existing phenomenon, and to draw out precise issues that may be unknown to the researchers. Focus groups aim at a discussion instead of on individual responses to formal questions, and produce qualitative data (preferences and beliefs) that may or may not be representative of the general population. The interviewer's function was simply to encourage the respondent to talk about the given topic with a bare minimum of direct questioning. The interviewer often acts as a catalyst to a comprehensive expression of the respondents' feelings and beliefs and of the frame of reference within which such feelings and beliefs take on personal significance (Kothari, 2004).

3.6.6: Standardised testing

A standardized test is a term primarily associated with large scale tests administered to sizeable population of students, such as a multiple choice test is any form of test that requires all test takers to answer the same questions, or a selection of questions from common bank of questions in the same way and that is scored in a standard or consistent manner, which makes it possible to compare the relative performance of individual students or groups of students. (Henrysson, 1969).

Standardized achievement testing creates assessment tools that permit someone to make a valid inference about the knowledge and/or skills that a given student possesses in a particular content area Misco (2008). Standardised tests play an important role in providing the researcher with information concerning student achievement and growth.

When test results are analyzed, score interpretations are often questioned. For this study standardised achievement test was administered to the students involved from all four secondary school to observe the knowledge and skills they have.

Table 3.2: Summary of methods of data collection, processing and analysis

Main research question	Data Type	Data Source	Method of Data collection	Data processing and Analysis
Has the teaching of computer studies been effectively implemented in secondary schools in Arusha Municipality	-Availability of teaching resources like textbook, computer, electricity and internet connection -Availability of qualified teachers	Students Teachers School Inspectors	Questionnaires Interviews Observation Testing	Frequency analysis Microsoft (Ms.) excel
RQ1. What is the status of computer studies teaching in Arusha	Number of Teachers and computers available in school Ratio of student per computer	Academic teachers Students Computer ... teachers	Observation Interview Focus group discussion	Frequency Content analysis
RQ3. Are there enough required equipment and infrastructure for teaching computer studies?	Availability of computers Number of computers Availability of internet and other learning resources	Students Computer teacher School inspector	Focus group Interviews Questionnaire	Frequency Content analysis
RQ4. Is there relationship between methodology used to teach computer studies and effective teaching	Student centred Hands – on Enough practice	Computer teacher	Interview	Frequency content analysis

Source: Study (2013)

3.7 Operationalization of effectiveness

Operationalization is the process of specifying the operations that will indicate the value of cases on variables. Operationalization connects concepts to observation (Garson, 2002). Operationalization identifies the specific set of rules that are used to indicate that the concept is present or not. In this study effectiveness of teaching computer was assessed in terms of: ration of computers available and the number of students, standardised achievement test for students to find the competence of the teacher. The

ratio of books to the number of students and lastly the quality of computer hardware and software and the ease and familiarity the students display using the hardware and software.

CHAPTER FOUR

THE FINDINGS AND DISCUSSION

4.1 Introduction

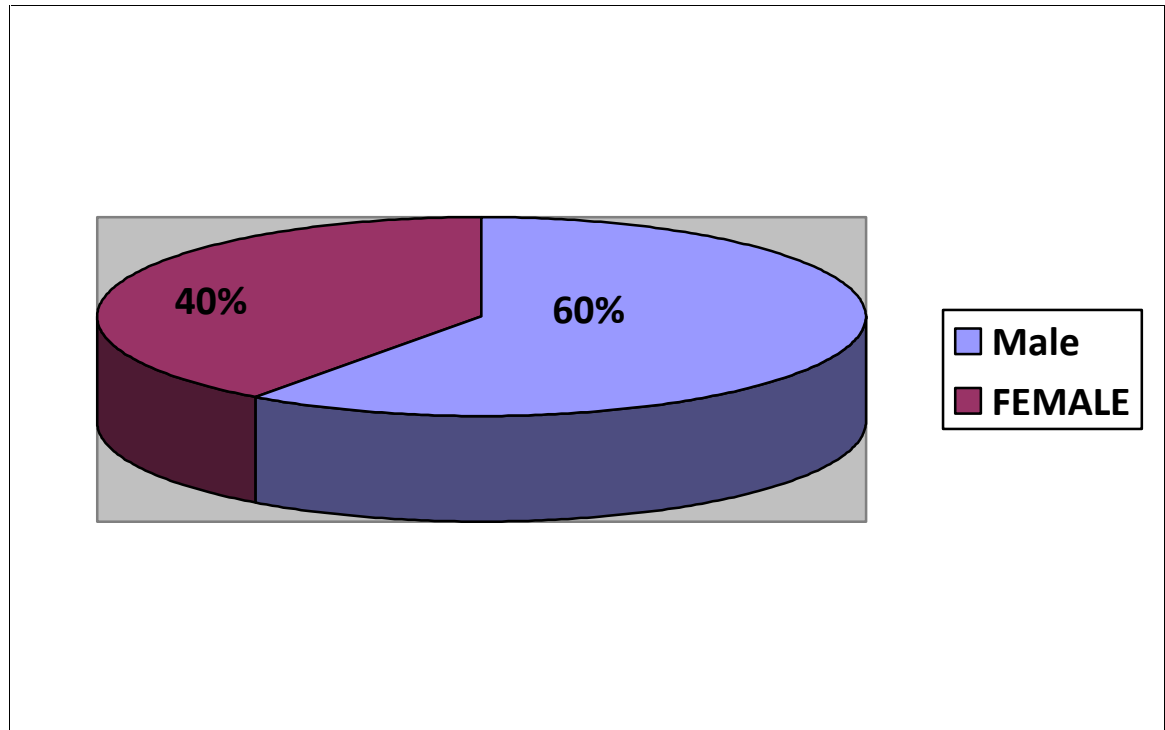
The main objective of the study was to examine effectiveness of teaching computer studies subject in secondary schools in Tanzania, specifically in Arusha Municipality. This study was necessitated by intrigue and fascination of computer knowledge and its impact on day to day life, in our daily activities, in schools, work places in the supermarkets. Computers are utilized at the national level and global, and computer knowledge is not a luxury for few but a survival tool for the coming generation. It comes as a shock that in the communities we live in people are not aware of the urgency for serious implementation of the Information Communication Technology policy (URT, 2003) and the ICT policy for basic education (URT, 2007). The ICT policy for basic education was formulated to guide the integration of ICT way from kindergarten to secondary schools to higher learning. The goal of the study was to help communities to be conscious on the importance of computer education to inculcate in them a paradigm shift. (Bukaliya, 2012).

This chapter presents first, the secondary schools that teach computer studies in Arusha municipality; second the assessment on the relationship between the teachers' qualifications and the teaching of computer studies on those schools, third the evaluation on relationship between computer equipment and infrastructure available in the school. Lastly, the methods used for teaching computer studies in secondary schools in Arusha Municipality.

4.2 Descriptive statistics

4.2.1 Respondent by Sex

Figure 4.1 Respondents by sex



Source: Field Data, 2014

From the study of 130 respondents it indicates that they are more male than female. Figure 4.1 shows that 76 (60%) respondents were male and female respondents were 52 (40%). These results indicate that girl child education is still a challenge in Tanzania as pointed out by UNDP (2011). Much has been done about girl education but girls still face a lot of challenges in acquiring an education, this could be due to the fact that Poverty still remains the main challenge to the improvement of girls' secondary education. For this study this was just an indication that computer knowledge is not equally received thus needs further research.

4.2.2 Respondents by age

Table 4.1 Respondents by age

AGE	FREQUENCIES
13 – 20	100(76.9%)
21 – 25	19(14.6%)
25 – 45	11(8.5%)
Total	130(100%)

Source: Field work (2014)

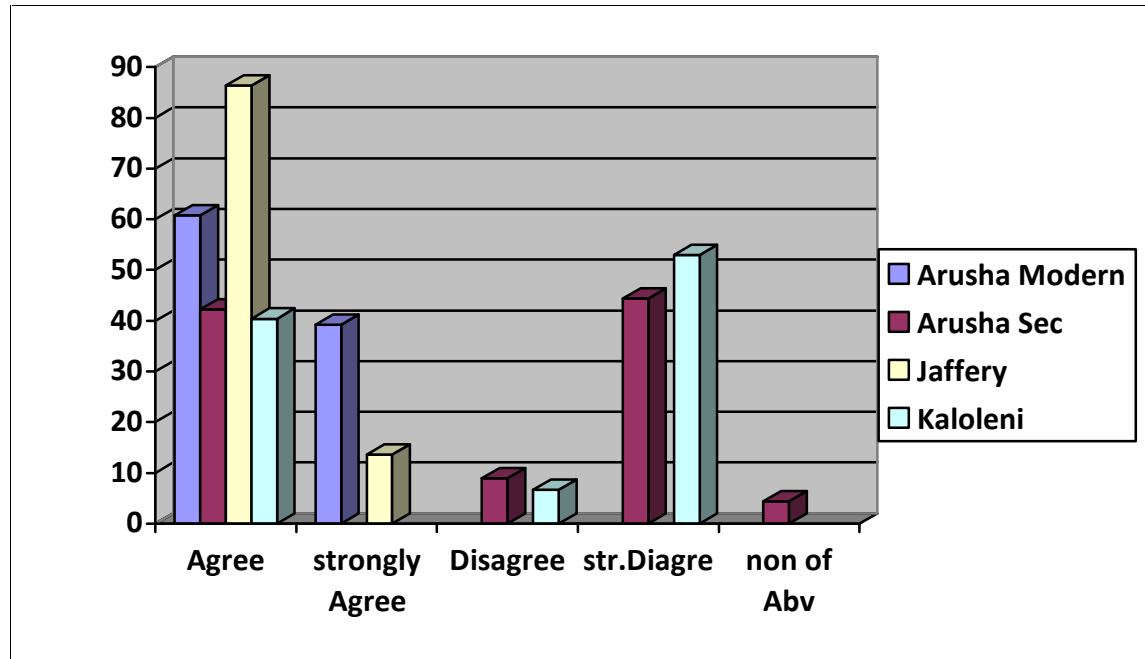
Table 4.1 shows that most respondents are young as they were the main respondent hence between age 13 – 20 were 100 (76.9 %), between age 21 – 25 were 19 (14.6%), this is mainly the forms five, and the age group between age 25 – 45 they were 11 (8.5 %) mostly consisting of other older respondents some teachers and school inspectors. it indicates that students who are the majority play a very important role in determining the effectiveness of the subject computer studies taught in secondary schools in Arusha municipality.

4.3 Computer Teaching in Arusha Municipality

The first research question was to find out the status of schools that teach computer studies subject.

4.3.1 Schools that teach computer studies

Figure 4.2: schools that teach computer studies



Source: Field Work (2014)

Computer learning seems to be an elusive subject not only to the study but even to students and that is why from the figure 4.2 respondents from the four schools could not agree whether they are being taught this subject or not. Respondents from Arusha Modern schools and Jaffery International Academy agreed 100% that computer studies subject is taught in their school, on the other hand, respondents from Arusha Secondary school and Kaloleni could not agree in unison that they are being taught computer studies subject. The figures illustrates that more respondents strongly disagree that they are being taught computer studies. Upon further investigation, through student focus group the researcher found out that in private schools unlike the government schools students were satisfied with the teaching of the course. In a focus group discussion in one of the schools the students responded that;

..... *“the computers in the computer laboratory are few, and were given as donations. When we go for a computer class, most of us don’t have a computer to use and therefore difficult to follow what the teacher teaches, moreover the room is usually crowded and cannot accommodate all of us.”*

From the respondents it can be noted that, to some degree all four schools have computers, but the manner which the computers are used and the extend of its usage is what students don’t understand. In private schools computers are part of their learning, it is integrated in their learning outside of the computer subject, they use to do their homework for different subjects therefore they are used to seeing them and using them. In government schools it is a different story. The computer lab is attended once a week for 40 minutes mainly form one and two, form threes upwards don’t use computers because they do not do an exam for it therefore teachers do not see the importance of teaching its use if students are not going to sit for the exam. This attitude discourages the students to be curious, or to be aware of the importance of technological knowhow.

Wozney, Venkatesh and Abrami (2006), stress that computer technology is an essential tool in today’s school environment it motivates students encourages them to explore and to learn in way previously unavailable to them ... it is a tool that cannot be ignored. Teachers on the other hand, when interviewed about their take on the teaching computer studies in secondary schools in Arusha Municipality the answers were very intriguing and not very easy to answer. First and foremost the teachers agreed that computer studies subject is taught in their school to but to different degrees. Respondents from government school pointed out that this subject is not given any priority since it not a passing subject meaning that even if a student’s opts to do the exam in the national form four exams it is not awarded any marks that is does not have any impact. The respondents from the private schools had a lot to say about this subject, not only do they teach it but they try to integrate computers in the whole learning experience, therefore they encourage the students to use computers for studying and doing homework. The private school seems to have more advantage compared to the government schools which according to the respondents they do not have enough computer for students for example in one government school the ratio of students per

computer is 1:48, and it's because of this students only learn computer subject in theory more than practical. Respondents from private school added that even though their students have enough computers at their disposal and other facilities like internet connection they still don't take computer studies subject any seriousness like they do other passing subjects like maths, physics e.t.c.

Therefore from the analysis made on the situation of computer subject teaching in schools has revealed that the computer subject teaching in the private schools seemed to be more effective than what is being done in the government schools. Gilmore (1995), contended that access to reliable and functional computer resources is a key factor in use of computers for instructional activities.

4.3.2 Teachers Perspectives

When respondents were interviewed about their take on the teaching computer studies in secondary schools in Arusha Municipality they were very intrigued. First and foremost the teachers agreed that computer studies subject is taught in their school to but to different degrees. Respondents from government school pointed out that this subject is not given any priority since it not a passing subject meaning that even if a student's opts to do the exam in the national form four exams it is not awarded any marks that is does not have any impact. The respondents from the private schools had stated that this subject, not only do they teach it but they try to integrate computers in the whole learning experience, therefore they encourage the students to use computers for studying and doing homework. The private school seems to have more advantage compared to the government schools which according to the respondents they do not have enough computer for students for example in one government school the ratio of students per computer is 1:48, and it's because of this students only learn computer subject in theory more than practical. Respondents from private school added that even though their students have enough computers at their disposal and other facilities like internet connection they still don't take computer studies subject any seriousness like they do other passing subjects like maths, physics.

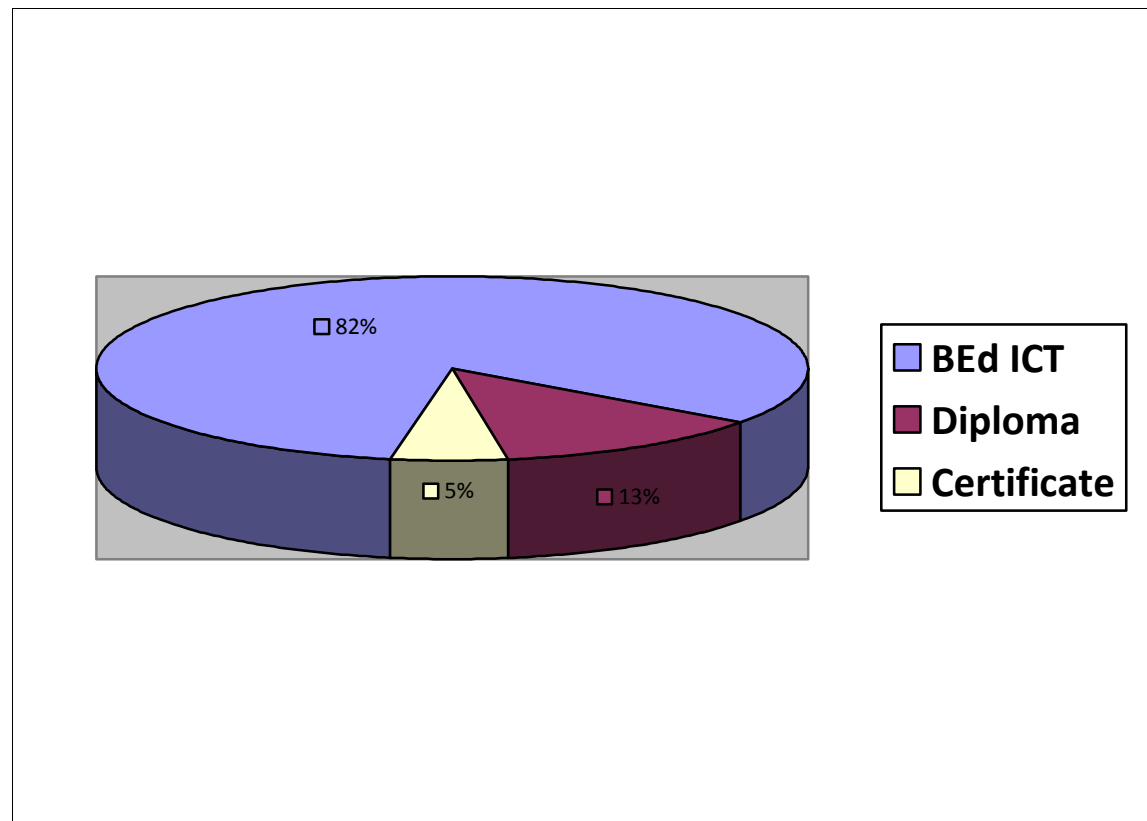
Therefore from the analysis made on the situation of computer subject teaching in schools has revealed that the computer subject teaching in the private schools seemed to be more effective than what is being done in the government schools. Gilmore (1995), contended that access to reliable and functional computer resources is a key factor in use of computers for instructional activities.

4.4 The capacity of staff to teach computer studies

The second research question was: Are there qualified teachers who teach computer studies subject. A test was given to students to assess the knowledge acquired. Teachers were interviewed to get their opinion on the role of their qualifications status on effective teaching of computer studies subject.

4.4.1 The staff capacity

Figure :4.3: Teachers qualification



Source: Field work, (2014)

For successful implementation of computer studies subject teaching teachers play a very important role. All over this country computer teaching and learning in different places have been influenced and affected by the availability, of teachers, their qualification and even their attitude towards teaching this subject. Most of the teachers are not effectively trained to teach this subject although it is their area of specialization. They are forced to go and teach even if he or she is not happy, ready or comfortable to do so.

In so doing the delivery becomes a problem and the products will not be good. However, there were a few teacher who were well trained on this area and they perform very well therefore the delivery was very good. These two groups of teachers will not work in the schools of the same quality; the poorly trained will go to one school while the one who were well trained will definitely go to the best schools. This could be justified by the observation the researcher did in the four schools. It was revealed that most schools have teachers who have been trained in either Bachelor of computer science, Bachelor of Education in ICT, Diploma or Certificates.

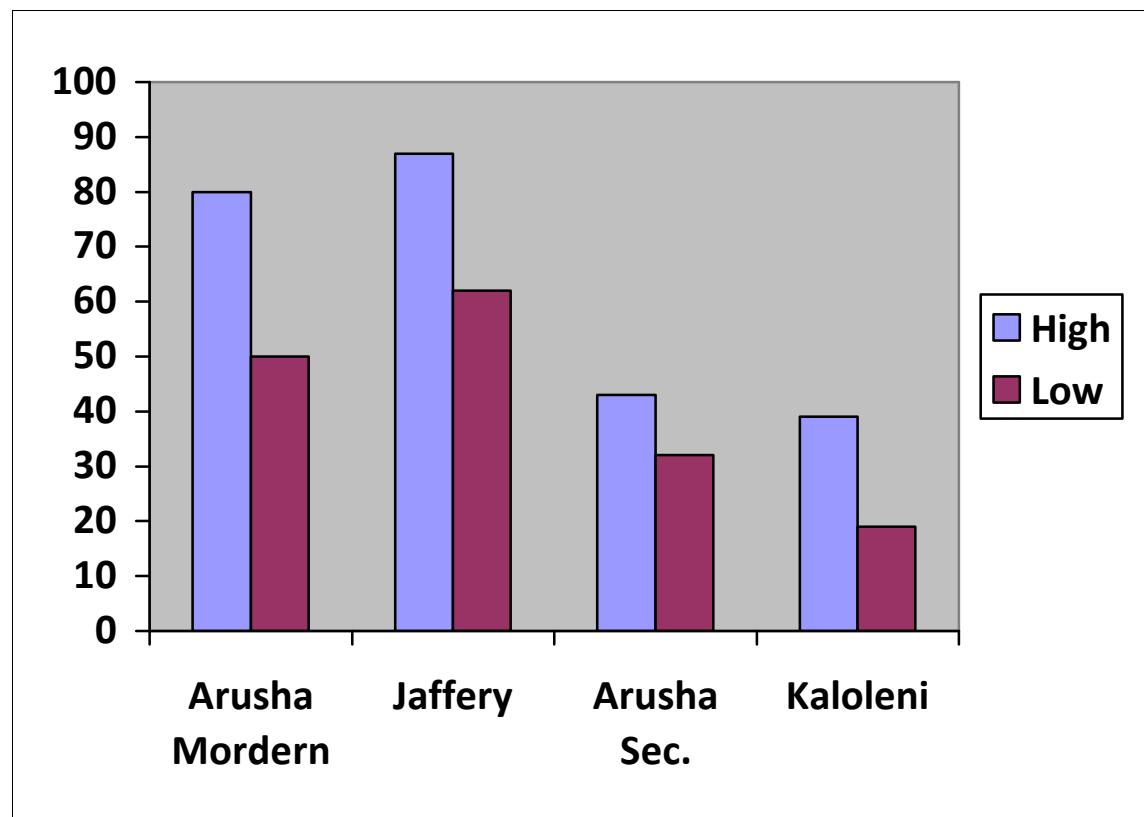
Whether, a teacher has a bachelor or certificate what matters is the capability to deliver practically. Therefore, through observation it has also been discovered that most of the best teachers have been found to be in Arusha Modern and Jaffery Academy while those with low or moderate ability to teach this subject go to the government schools because they are not competent enough or lacked confidence.

As one of the head of education department explained that, they have had an interview sessions with many graduates from certain universities, who have also specialised in ICT, but their competence in this subject did not meet the standards of the school, and therefore they could not hire any one of the six teachers who came for the interview.

In connection to the best qualifications of the teachers who teach computer subject in secondary schools, for the researcher to establish whether the computer subject is effectively taught by these teachers, the researcher used a test instrument (Appendix 2) to see whether the students as the end products could help the researcher comment on the effectiveness or ineffectiveness of the programme.

The test was designed as an alternative to practical to using computers and it revealed how much learning the students acquired. Most questions based on practical reality of the programme like switching a computer on and off, opening Microsoft Office word, Microsoft office excel, etc. and the criteria for effectiveness of the programme was for the students to get 45/100 and above. When the test was administered the truth of the qualifications of the teachers together with effectiveness and ineffectiveness of the programme was revealed. From Arusha Modern School, the first student got 80% and the last got 50%. In Jaffery secondary school, the first student got 87% and last one got 62%. But when the same test was given to students from Arusha Secondary school, the first student got 43% while the last one got 32%, the first student in Kaloleni got 39% while the last one got 19 percent.

Figure 4.4: Results for the test instrument

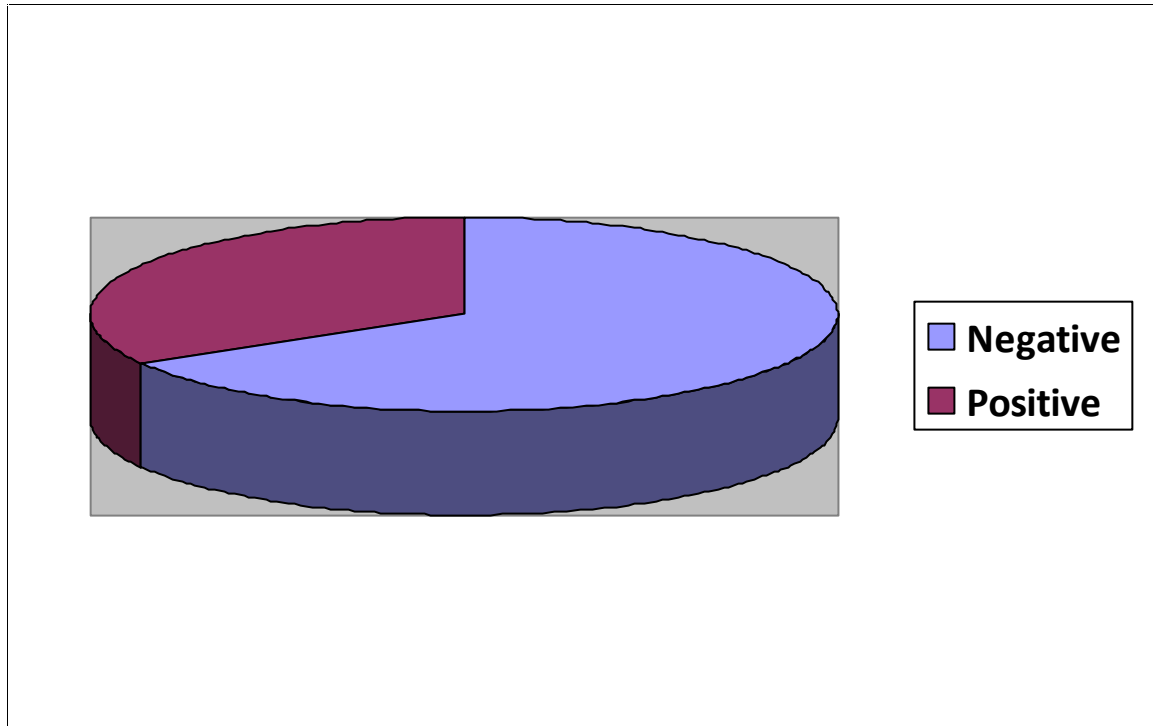


Source: Field Work (2014)

These results suggest that the teaching of computer subjects in secondary schools is effectively done on the private schools than in the public schools. This is because the natures of most teachers who teach in most public schools are the best on the theoretical part of the subject but they are not good when they are needed to practice the knowledge (Bakr, 2011). Through focus group discussion with the student study discovered that more than 80 percent of the students in the public secondary schools come from poor families which could not afford a computer for the family which could probably help these children practice the skills at home. But the same question was asked to the students of Arusha Modern and Jaffery and it was discovered that one of the advantages they have is that they come from families that could afford computer and internet so they have had experience of using computers and other devices since primary schools. So when they are taught in schools it is some kind of repetition. Therefore, for public schools, computer teaching is examination oriented while in public schools it is for both, passing the examination and as knowledge to be used in the learning process and after school. Olumiyiwa & Segun (2013), confirm that students attending private secondary schools are also more engaged in computer literacy than their public school counterparts in terms of the frequency and patterns of use of computers and internet.

4.4.3 Teachers' attitude on computer studies subject teaching

Figure 4.5 Teachers attitude



Source: Fieldwork (2014)

The attitude of teacher for using computers is an important factor in implementing computers studies in secondary schools. Pelgrum & Plomp (1991), pointed out that attitude was the key to success for implementation of computers in instructional purposes. It is from perceived educational and social impact, results of training, and self – confidence. When asked about their attitude and morale, it was discovered that teacher respondent attitude and morale was not positive due to different challenge they were encountering in teaching the computer studies subject. In all the four schools the respondents seemed to feel that they were not appreciated since this subject like other science subjects that is mathematics and physics is difficult and doesn't have a lot of teacher available to teach this subject. This makes them feel over used with little motivation or incentives for them, teachers may be provided institutional incentives to complete the educational technology professional development programs at all levels.

These incentives may include laptops, release time and services such as paid technology summer institutes (Liu & Szabo, 2009). Furthermore, when asked about their confidence level in teaching computer studies four teachers respondents from the public schools (80%) feel like they did not get sufficient training for teaching this subject because even at the university so they feel like they should get in-service training as Bybee & Loucks-Horsley, (2000); observed that professional development and training programs with a focus on educational computing are strongly needed. Responding to the question about whether they feel competent to teach computer studies through demonstration in class, (50%) of the teachers explained that they lack confidence to teach appropriately hence end up doing lectures in class but not doing hands-on. Another reason for lack of confidence there are not enough computers to use in the class with a ratio of 1:48 that becomes a challenge to implement effectively. According to these results it is vivid that the teachers' attitude to teaching computer studies is still low according to Myers & Halpin (2002), low teachers' attitude is a major predictor for future computer use in the classroom.

4.5 Infrastructures for Teaching Computer studies Subject in Secondary Schools

The third research question was: Are there enough required equipment and infrastructure for teaching computer studies

Table 4:2 Infrastructure for effective computer teaching

School Name	Do you have well equipped computer lab in your school				
	Agree	Strongly agree	Disagree	Strongly disagree	None of the above
Arusha Modern International School	73.9%	20.0%	4.7%	.0%	2.2%
Arusha Secondary School	11.1%	24.4%	49.9%	12.2%	3.1%
Jeffery International Academy	77.8%	17.8%	4.4%	.0%	.0%
Kaloleni Secondary School	44.8%		49.0%	.0%	6.2%

Source: Field work (2014)

4.5.1 Availability of computer laboratory

The successful implementation of the recently introduced programmes like computer teaching subject in secondary schools depends much on the well established infrastructures and devices like a laboratory, computers, textbooks and other materials, reliable power supply and the ratio one computer to the number of students available. Respondents who were students participated in this study agreed that they have a computer laboratory. Starting with Arusha Modern secondary school where respondents agreed 98%, followed by Arusha Secondary where 53% respondents pointed out that they have a new laboratory but confessed to not using it much of the time because it cannot accommodate all of them. Jeffery school according to the respondents have well equipped laboratory and this is 100% of the respondents. Kaloleni secondary has a computer lab that 49% of respondents agreed that there is a lab.

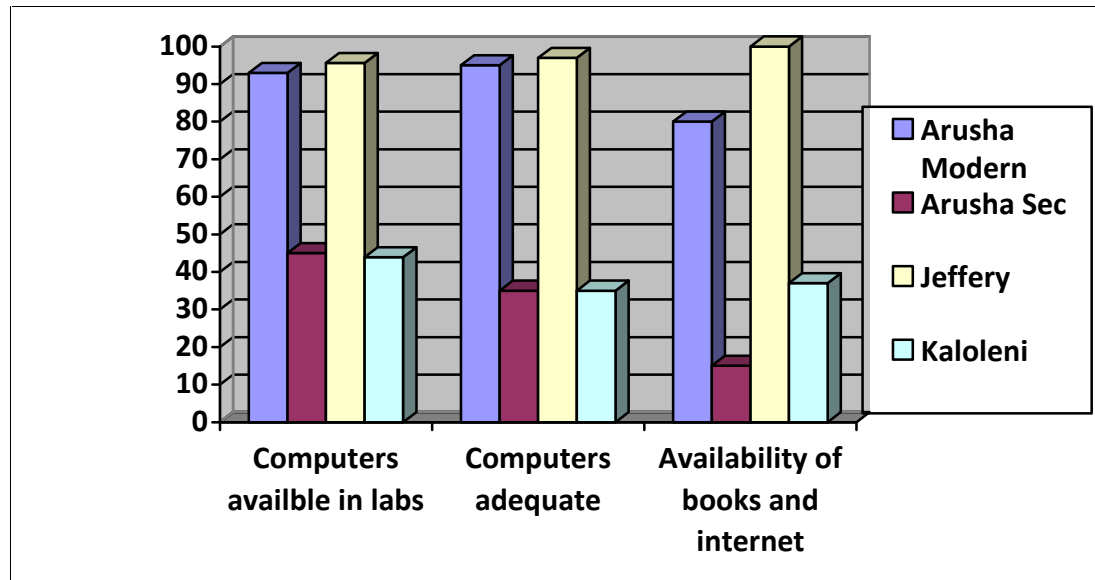
Figure 4.6: The Launch of the new computer Lab at Arusha Secondary



Source: The Guardian, ippmedia (2013)

4.5.2 infrastructure for computer studies subject

Figure 4.7 infrastructure for computer studies subject



Source: Field work (2014)

Starting with Arusha Modern secondary school, 95.3 (95.3%) percent respondents agreed that their school is well equipped computer, adequate computer 95 (95%) computer books and internet 80 (80%). Another school which the researcher went for data collection was Arusha Secondary school and the responses were, 45(45%) percent respondents agreed that their school is well equipped computer, adequate computer 35 (35%) computer books and internet 15 (15%). Additionally, there was 95.6 (95.6%) of the students' population from Jaffery Acdemy agreed that their school is well equipped computer, adequate computer 95 (95%) computer books and internet 100 (100%). Responses from Kaloleni secondary school revealed that there was 45 (45%) of the entire school population agreed that the school is well equipped computer, adequate computer 35 (30%) computer books and internet 25 (25%).

Figure: 4.8: Students in the computer laboratory



Source: Field Work (2014)

As indicated from the statistics above there are differences in the availability of infrastructures among these schools. In this study, it was observed that Arusha Modern and Jaffery Academy have good infrastructures which support the teaching of computer studies subject. The researcher witnessed a computer studies laboratory could take 50 students at a time at Jaffery and Arusha Modern Schools. And they have enough and up to date computers which have been designed specifically for computer teaching purposes. Segun and Olmuyiwa (2013), their study showed that private secondary school students have access to computers in higher measures than their public counterparts either at home or at school. The results are highly indicative of higher accessibility to computers in private secondary schools and high level of integration of computer technologies in Nigeria.

It was also observed that the facilities for computer studies teaching in the private schools could not be compared with the one in the public schools. In this regard, it was noted that in Arusha Secondary and Kaloleni schools which are both owned by the government of Tanzania do not have well equipped computer laboratories. Instead they have small rooms where about 22 to 25 computers together with other gadgets such as

outdated printers and internet without connectivity. At the same time these schools have over five hundred students.

Figure 4.9: Internet hub



Figure 4.10: School Server



Source: Field Work (2014)

The private schools have almost everything they need to effectively teach computer subject and moreover incorporate the general learning process by connecting their computer with internet connection. This is done so as to maintain their clients, to get high profit in their business but the government is trying to provide services for her people. The intentions and plans to provide such services to her people have well been planned on the papers but the actual practices and implementation are not there. It is therefore a good time for the government to check whether what has been introduced is effectively implemented. Pelgrum (2001) found that an insufficient number of computers in schools was the main reason for not realising a school's computer-related goals

4.6 The Methods of Teaching Computer studies in Secondary Schools

Is there relationship between methodology used to teach computer studies and effective teaching.

4.6.1 Methods of teaching

Table 4.3 Methods of teaching

Methods of teaching	Number of respondents	Percentage
Demonstration	4	80%
Hands on	2	40%
Discussion	6	100%
Brainstorming	6	100%
Debate	3	50%
Internet searches	2	40%

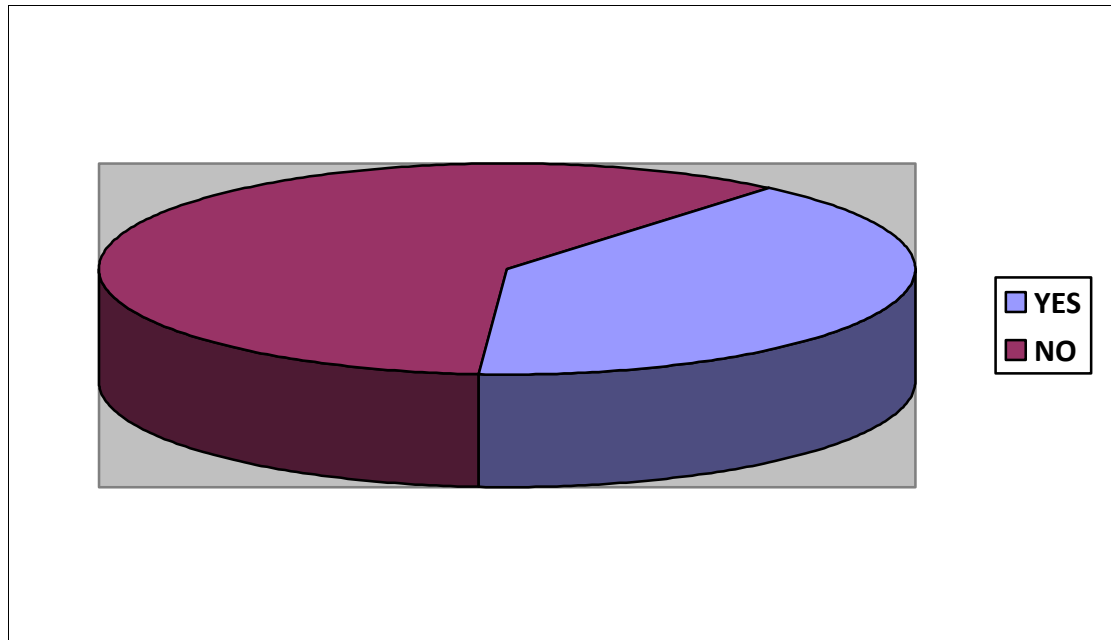
Source: Field data (2013)

Teachers are responsible for creating classrooms that promote effective learning as well as evolving and adopting effective instructional strategies. From the table 4.3 it can be deduced that computer studies teachers prefer to use discussions and brainstorming (100%) According to URT (2005), the teaching and learning process using this reviewed syllabus (Information and communication technology), should be student centred and activity oriented.

A computer study is a subject that requires a lot of activities and daily practice for student to understand and achieve learning goals. When further interviewed teachers taught computer studies in Arusha and Kaloleni secondary schools they responded that: *“...the syllabus suggests that the teacher should use demonstration to teach students how to interact with Microsoft word yet the problem is not the ability to demonstrate but the facilities. The school has 20 computer and over 120 students per class is a challenge”*. Levin and Gordon (1989), suggest that teachers having received formal computer training can be more positive about computer than teachers with knowledge acquired primarily by trial and error cannot be certain to the same degree. Furthermore computer subject teaching demands the methods that make it possible for teacher and students interact meaningfully the teacher’s competence; the facilities and the instructional time given to the students have a strong influence on the successful computer subject teaching.

In this study the syllabus for Information and computer studies for secondary schools was used as a document review, and it was hence observed that the syllabus for computer subject do not real reflect the content, competence and the environment in which the subject is taught.

Figure 4.11: motivation to use proper teaching method for computer studies



Source: field Data (2014)

Therefore the major difference between the government schools and the private schools in computer subject teaching is the manner in which this subject is taught in addition to the availability of teacher and the physical infrastructures. The teachers from the private schools are more motivated to teach computer subject because of the facilities which make their teaching task simple. One of the respondents during the interview commented that “...the effectiveness of computer subject teaching is detected by facilities and infrastructure regardless of the methods without computers, learning resources like books and internet ...that is what our school has done making sure every student has a computer whenever they are learning”. Teachers in the government schools are not motivated to teach these subjects because the environments are not conducive and the government is not supportive to their teachers at all.

Methods for teaching could not have any influence on teaching because unavailability of computers in some of the schools because computer studies subject require a lot of practice to achieve competence.

4.6.2 Instructional time

Table 4.4: Instructional Time for Computer Studies subject per week

School Name	Instructional time per week				
	Once	Twice	Thrice	Fourth	Non of the above
Arusha Modern International School	45%	22.0%	24.7%	.0%	2.3%
Arusha Secondary School	90.4%	0.0%	0.0%	0.0%	9.6%
Jeffery International Academy	52.8%	25.8%	21.4%	.0%	.0%
Kaloleni Secondary School	93.9%		3.0%	1.1%	2.0%

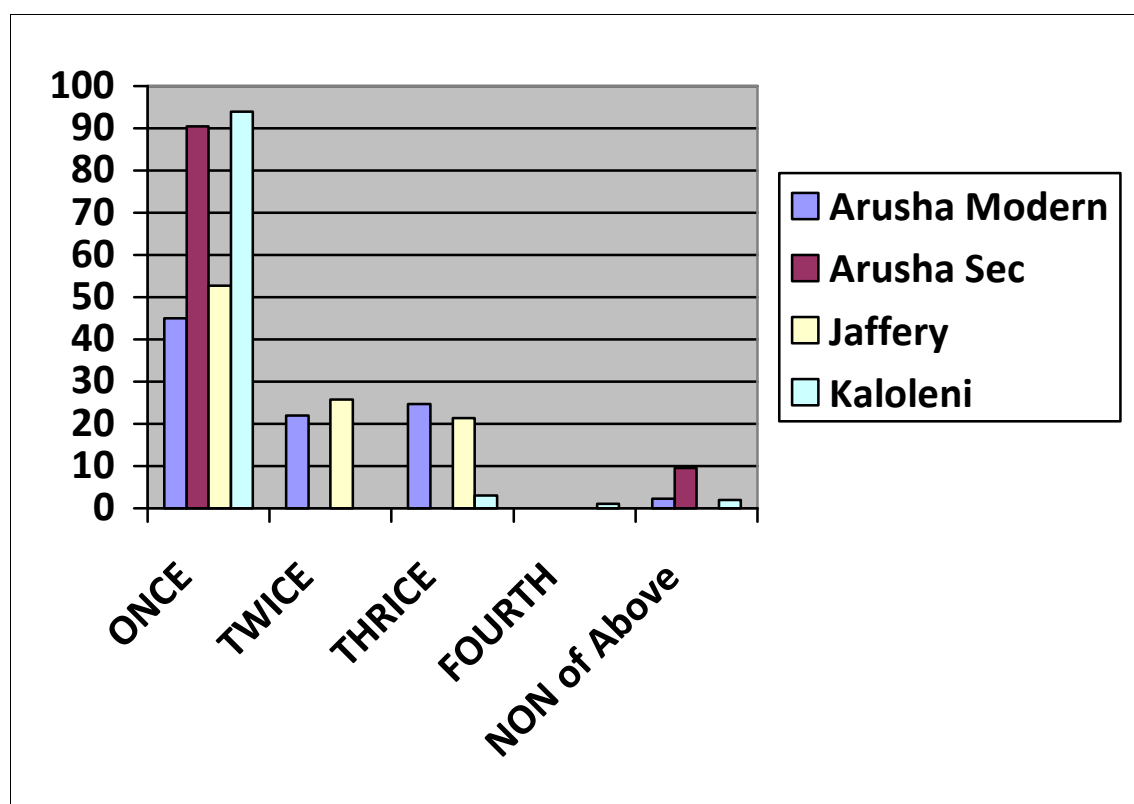
Source: Filed Data, 2014

this study has revealed that instructional time in most schools where they teach computer subjects is not enough. This has been revealed by the responses from the questionnaires presented to the students of the four schools as displayed in the figure 4.4.

The time allocated for instructional time is one among the many major factors that a computer class in a computer teaching subject considers necessary. When the students are given longer time to study the subject, theoretically and practically it helps them better develop their inquisitiveness in the learning environment (Drury 1995). Instructional time must be different from tests and quizzes, assignments, group works and homework. Instructional time should enable teacher to interact with his or her students in the process of habit formation and behavioural changes.

Basing on the nature of the infrastructure, attitude and the readiness of the teachers in our schools, it has been difficult for some schools to provide more time for the students to learn. It is a routine like schedule that all the teachers in the government schools spend shorter time for their employer but longer time for their personal businesses. This has been revealed by the students who were giving their responses that there is only 80 minutes per week because of the numbers of classes available which do not corresponds with the computer teachers in schools.

Figure 4.12: Instructional Time in a Computer Class



Source: Field work (2014)

The careful observation was made from figure 4.9 through focus group discussion among the students indicated the varying answers based on the experiences from their schools. For example Arusha Secondary and Kaloleni secondary schools indicated that they have a computer class once a week and they do not have any other opportunity for practice.

But on the part of Arusha Modern and Jaffery Academy revealed that the students from these schools have a computer class once in a week for every class but there is not enough time for them to go for practices and their teachers are ready for such students. This tendency could be motivated by the amount of money that the teachers are paid as their take home salaries or the nature of the environment on which the teachers are subjected to work. The experiences show that private schools motivate their employees when they do their job well but the public schools do not do it often and therefore the teachers are discouraged to think of the students when they teach but full filling their responsibilities regardless whether the students understand or not.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Summary

The overall objective of this study is to examine the extent to which teaching computer studies has been effective in Secondary schools in Arusha Municipality Tanzania. Specific Objectives to find the status of schools in Arusha municipality that teach computer studies, to assess whether schools have qualified teachers to teach computer studies subject, to find out if the schools teaching computer studies have the required equipment and infrastructure and to explore appropriateness of the methodology used to teach computer studies in secondary schools.

The literature review about effectiveness of teaching computer studies subject in Arusha Municipality was done using both theoretical and empirical literature. The theoretical review covered the definition of key terms and theories upon which the study was based. Empirical study review supported the study by comparing different studies that were done before by other researchers.

The theories used for these studies were experiential learning theory (ELT) (Kolby 1984) and deliberate practice theory (Ericsson 1993). Kolby asserts that knowledge is continuously gained through personal and environmental experiences. For one to gain genuine knowledge from an experience one should be willing to be actively involved in the experience, have time to reflex on the experience, be able to use analytical experience to conceptualise the experience and lastly be able to possess decision making and problem solving skill in order to use the new ideas gained from experience. Deliberate practice theory on the other hand not only stress on the importance of practice in acquiring and achieving a skill, but it needs extra effort. To improve skill acquisition and performance it requires a highly organized activity that demand maximal physical and mental effort characterised by specific designed activities (Ericsson 1993).

For the sake of this study survey research design was used. School survey was utilised because it facilitates in collecting a large amount of data from a sizeable population for

generalised effectiveness. A school survey research design provided guidance for a comprehensive study of existing educational conditions undertaken to determine the overall effectiveness of the school programme with a view toward improvement where indicated (Singh 2006). School survey was also useful for obtaining data from the field by using interactive and standardised means such as questionnaire, interviews and controlled observations, focused group and documentary review. This study included the computer studies subject teachers and their students in form one, three and form five from both public and private secondary schools that teach computer studies in Arusha municipality. Systematic sampling was used with the sample size of 140 respondents. Quantitative data were collected and analysed by using excel and simple frequency analysis and cross tabulation. In qualitative data analysis content analysis was used.

From the findings, computer studies subject is still a vague idea and not taken serious. The study indicates that this subject is being taught in secondary schools even though the degree of it varies from school to school. Computer studies subject is not an exam subject as they call it this means it is taught but by the end of four years the exam does not carry any weight in the national examination because of this, it is not taken serious by both teachers and students. Furthermore, teachers face a lot of challenges concerning teaching this subject these include lack of enough training ,lack of a well equipped laboratory, the computer student ratio is poor and this makes difficult to apply the appropriate methodology as required by the ministry of education and vocational training.

5.2 Conclusions

Based on research questions the following conclusions were made:

5.2.1 The status of schools that teach computer studies

The findings of the study show that, to some degrees all four schools have computer, but the manner which the computer are used and the extent of its usage is what students don't understand. In private schools computers are part of their learning, it is integrated in their learning outside of the computer subject, they use to do their homework for

different subjects therefore they are used to seeing them and using them. In government schools it is a different story. The computer lab is attended once a week for 40 minutes mainly form one and two, form threes upwards don't use computers because they do not do an exam for it therefore teachers do not see the importance of teaching if students are not going to sit for the exam. This attitude discourages the students to be curious, or to be aware of the importance of technological knowhow.

5.2.2 Teachers capacity to teach computer studies subject

The study indicates that computer teaching and learning in different places have been influenced and affected by the availability, of teachers, their qualification and even their attitude towards teaching this subject. However, most schools have teachers who have been trained in either Bachelor of computer science, Bachelor of Education in ICT, Diploma or Certificates. On the other hand, most of the teachers feel like they are not effectively trained to teach this subject although it is their area of specialization. In so doing the delivery becomes a problem and the products will not be good. However, there were a few teachers who were well trained on this area and they perform very well therefore the delivery was very good and students performance reflected that.

Furthermore, the study showed that teachers' attitude and morale was not positive due to different challenge they were encountering in teaching the computer studies subject. In all the four schools the respondents seemed to feel that they were not appreciated since this subject like other science subjects like mathematics and physics is difficult and does not have a lot of teachers available to teach this subject.

5.2.3 Infrastructure for computer studies subject teaching

The findings show that, private schools have almost everything they need to effectively teach computer subject, these include a well equipped computer laboratory, electricity with a standby generator incase of power outage, internet and up to date textbooks. Moreover, incorporates the general learning process by connecting their computer with internet connection. This is done so as to maintain their clients, to get high profit in their business. The government schools on the other hand, study shows that this programme is not well implemented. Most of the school the government has the

intentions and plans to provide such services to her people have well been planned on the papers but the actual practices and implementation are not there. These school have few computers compared to the ratio of the students, the schools rely solely on electricity without any backup plans, internet connection is a luxury therefore not a need in these schools. This poses a challenge to effective teaching computer studies.

5.2.4 Appropriate methodology used to teach computer studies subject

Findings of the study suggest that teaching and learning process of the computer studies subject is guided by the reviewed syllabus (Information and communication technology), and this is student centred and activity oriented. To simplify the act of teaching and learning depend on the teaching methods that are relevant to the subject in question. According to the Tanzania syllabus the methods suggested to teach this subject effectively are; demonstration, hands-on, discussions, brainstorming, debate and internet searches. Computer subject teaching demands the methods that make it possible for teacher and students interact meaningfully.

Furthermore the finding show that, time allocated for instructional time is one among the many major factors that a computer class in a computer teaching subject considers necessary. Instructional time should enable teacher to interact with his or her students in the process of habit formation and behavioural changes. But this study has revealed that instructional time in most schools where they teach computer subjects is not enough

5.3 Policy Implications

The findings of this study have important policy implications including the need for raising awareness for this computer studies subject so that students and teachers can take this subject serious. Teacher training and in-service training should be prioritised especially on identifying innovative alternative approaches and smart sustainable solutions to deal with challenges such as electrification, lack of computer and internet. Lastly but not least is the need for monitoring and evaluation to support the development and delivery of computer studies subject in secondary schools. Implementation of the policy ICT Policy for basic education of 2007 by providing a framework for computer studies related projects

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APPENDICES

APPENDIX: I

QUESTIONNAIRES FOR STUDENTS

Date:

Preamble:

My name is Zilpa Gudu Olang', a Master's Degree student at Mzumbe University, I am carrying out a study on "*The Effectiveness of Teaching Computer Studies in Secondary Schools in Tanzania; A case of Arusha Municipality*". Please kindly respond to the following questions, which are very important for the success of this study and the information you give will be treated with high confidentiality.

Thank you very much for your understanding.

SECTION A:

STUDENTS' BACKGROUND INFORMATION

Please **check** where applicable to you

1. Name of the school.....
2. Student's Gender: Male [] Female []
3. Class Level: Form Two [] Form Three [] Form Five []
4. Age group: 13-16 [] 17-20 [] 21-25[] 26-30+ []
5. Home Place: ...Arusha....[], others please specify.....
6. Student's Nationality: Tanzania [.....]...Others please specify.....

SECTION B
INFORMATION ON COMPUTERS

*Please **check** one item which is most appropriate to you*

1. Do you know a Computer

A. Agree []

B. Strongly Agree []

C. Disagree []

D. Strongly Disagree []

E. Non of the above []

2. Can you use a Computer

A. Agree []

B. Strongly Agree []

C. Disagree []

D. Strongly Disagree []

E. Non of the above []

3. Does your school have Computer

A. Agree []

B. Strongly Agree []

C. Disagree []

D. Strongly Disagree []

E. Non of the Above []

4. How many Computers do you have in your school

- A. Between 1and 20 []
- B. 21and 40 []
- C. 41 and 60 []
- D. 61 and 100 []
- E. 101 and above []

5. How many are you in your class?

- A. Between 20 to 45 []
- B. Between 46 to 60 []
- C. Between 65 to 85 []
- D. 86 to 100 []
- E. 101 and above

6. Do you have computer teachers in your school?

- A. Agree []
- B. Strongly Agree []
- C. Disagree []
- D. Strongly Disagree []
- E. Non of the above []

7. How many computer teachers in your school

- A. 1 to 2 []
- B. 3.to 4 []
- C. 5 to 6 []
- D. 7 to 8 []
- E. 9 and above []

8. Do you have books for computer education
- A. Agree []
- B. Strongly Agree []
- C. Disagree []
- D. Strongly Disagree []
- E. Non of the above []
9. How many books does the school have
- A. 1 to 4 []
- B. 5 to 10 []
- C. 11 to 15 []
- D. 16 to 20 []
- E. 21 and above []

PART C

INFORMATION ON INFRASTRUCTURE

10. Please **circle only one letter** in each item from the following questions

- a) The school has a laboratory for computer studies
- [A] I agree
- [B] I strongly agree
- [C] I disagree
- [D] I strongly disagree
- [E] Non of the above
- b) The school uses normal classroom for computer studies
- [A] Agree
- [B] Strongly agree
- [C] Disagree
- [D] Strongly disagree
- [E] Non of the above

c) There is a reliable power supply in the school for teaching computer

[A] Agree

[B] Strongly agree

[C] Disagree

[D] Strongly disagree

[E] Non of the above

d). In general, would you say computer teaching in your school is:

[A] Excellent

[B] Very good

[C] Good

[D] Fair

[E] Non of the above

Thank you very much for your help!

TEST FOR STUDENTS

Date:

Preamble:

My name is Zilpa Gudu Olang', a Master's Degree student at Mzumbe University, I am carrying out a study on "*The Effectiveness of Teaching Computer Studies in Secondary Schools in Tanzania; A case of Arusha Municipality*". Please kindly respond to the following questions, which are very important for the success of this study and the information you give will be treated with high confidentiality.

Thank you very much for your understanding.

1.A(n) _____ page at a web site can help you find answers to common questions

- (a) ASP (B) OSP C) (FAQ) (D)WBT

2. The instruction that allows you to run application software are contained in the

- (a) operating system (b)utility (c)antivirus program (d)software package

3. The _____, a small symbol on the screen, moves as you move the mouse

- (a) icon (b) pointer (c) desktop (d) button

4. A(n) _____ is a graphical element that you activate to cause a specific action to take place

- (a) desktop (b) icon (c) pointer (d) button

5.Text that appears at the bottom of each page is called a _____

- (a) header (b) footer (c) macro (d) template

6. A(n) _____ is a technology that combines text, graphics and other visual images to make software easier to use

- (a)GUI (b) command line interface (c) operating system (d)icon

7. A special window that program displays to provide information, present available options, or request a response is called a _____
- (a) smart tag (b) dialog box (c) title bar (d) shortcut menu
8. A(n) _____ is an on screen work area that can display graphical elements such as icons and dialog boxes
- (a) desktop (b) operating system (c) GUI (D) icon
9. A collection of drawings, diagrams, and photographs that you can insert into documents is called
- (a) clip art (b) word wrap (c) word art (d) auto format
10. A _____ is a single point in an electronic image
- (a) pixel (b) resolution (C) dot (d) megapixel

Thank you very much for your help