

**THE EFFECTIVE USE OF INFORMATION AND
COMMUNICATION TECHNOLOGY IN TEACHING AND
LEARNING IN SELECTED PUBLIC PRIMARY SCHOOLS OF
MOROGORO MUNICIPALITY IN TANZANIA**

BY

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**A Dissertation is submitted to the Faculty of Social Science (FSS) in Partial
Fulfilment of the Requirements for the Award of the Master of Arts in
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CERTIFICATION

We, the undersigned certify that we have read and hereby recommended for the acceptance by the Mzumbe University, the dissertation titled “*The use of Information and Communication Technology for teaching and learning in selected public primary schools of Morogoro municipality in Tanzania*” in partial fulfilment of the requirements for the award of Master of Education (M.A.Ed.) degree.

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DEAN, FACULTY OF SOCIAL SCIENCES

DECLARATION AND COPYRIGHT

I, Niceta D. Temu declare that, this research report is my own original work and it has not been submitted and will not be submitted to any other college, institution or University than Mzumbe University for academic award.

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DEDICATION

I dedicate this work to my lovely parents “Mr Daniel Peter” and “Mrs Theresia Daniel” who always encourage and advise me to do the right thing at the right time.

LIST OF ABRIVIATIONS

E1,2,3	ICT experts from three selected schools
FGD	Focus Group Discussion
H1,2,3	Head teachers from three selected schools
ICT	Information and Communication Technology
MoEVT	Ministry of Education and Vocational Training
M1,2,3	Primary School Teachers from three selected schools
P1,2,3,4	Pupils from three selected schools

ABSTRACT

This study intended to assess the effective usage of information and Communication Technology in public primary schools. The study was guided by three specific objectives; (1) to identify the roles of ICT in teaching and learning process, (2) to find out factors influence usage of ICT to make effective teaching and learning in public primary schools and (3) to search challenges of using ICT in teaching and learning in public primary schools of Morogoro Municipal Council in Tanzania.

The study applied qualitative research approach to make easy collection of deep information that include feelings, experiences and deep understand from the respondents. Explanatory case study design was employed, the study included total of twenty-one participants specifically; three head teachers, three ICT experts, three subjects' teachers and twelve pupils. Focus group discussion, interview and document review were used to collect information which was analysed through content data analysis.

The major findings revealed that there are enough and quality teaching and learning materials from the internet and school savers that help teachers and pupils to get quality and useful education. Also, teachers and pupils are much interested to integrate ICT in teaching and learning but there are serious challenges that make the ICT equipment to remain as useless facilities in the schools. Poor management of ICT facilities, deprived electricity, insufficient ICT equipment and teachers' lack skills and knowledge on ICT usage, are the problems that hinder the usage of ICT in public primary schools.

The researcher recommends that there is a need to strengthening the government's ICT policy for primary education to push the educational stakeholders to take the issue of ICT integration in education extremely. There should be ICT training for teachers and other education stakeholders in order to bring competent in ICT usage in public primary schools.

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CHAPTER ONE

INTRODUCTION AND PROBLEM SETTING

1.1 Introduction

This chapter aimed to provide the background information about the effective usage of ICT in teaching and learning in primary education as it is shown by different researcher around the world. It included very important and relevant studies that support the study.

1.2 Background of the Study

The advancement of technology in the world is the major facilitator of the social and economic growth, citizen participation in different aspects of human life and the most job creation. Information and communication technology (ICT) are shaping other aspects such as world economy, governing societies and education system of the world (World Bank, 2016). Primary schools' pupils can use computer technology in teaching and learning due to the globalization and computer technology. Information and communication technology (ICT) are being integrated in the teaching-learning process in many learning institutions of the world. Information and communication technology are now the mature part of the primary education curriculum in Tanzania. Once restricted to upper secondary schools as "computer studies", ICT now is taught even to children of kindergarten or pre-primary schools. This is to help children and primary school pupils to be aware of the world technology (Mulamula, 1998).

The Millenium Development Goals, which are influenced by the formations of the ICTs policy plan in the developed countries as well as in developing countries aim to provide free and quality education to every child especially those who come from the poor families (Smeets, 2005). In achieving Millennium Development Goals, the ICTs education policies should not be escaped. In order to achieve development globally in Tanzania, it is important to introduce and to implement ICT from kindergarten or pre-primary to University level of education. Additionally, the World summit on the Information and Society (WSIS) done in Geneva (2003) and Tunis (2005), produced

the directives through which the access of ICT globally will be achieved in 2025 basing on the ICT development and expansion countries (URT 2010).

According to Jugran, (2009) the world views Education as central way to economic, wealth, the key to science and technological progression, the means to overcome joblessness, foundation to social equity and enhancement of political and cultural socialisation. Different scholars have proved that, in order to have good and quality education in Tanzanian primary schools that can move with the World's globalization, it is important to go hand to hand with the ICT integration in all primary level of education. The study done by Kira (2016), suggested that the use of ICT in primary level of education can results in excellence education quickly since the world of science and technology is full of ICT, ICT can simply full fill education objectives and goals.

According to URT (2007) the history of ICT in Tanzania can be drawn back to the setting up of the first computer machinery in 1965. The first computer was integrated in the Ministry of Finance because this is the important ministry that needs support of computer technology in completing the daily activities. Later, as years increased the number of computers increases too up to seven by the middle of the 1970. Lubua and Maharaj (2012) stated that, around the 1974 the Government framed the task power to advice on practicality of using computers in all the government ministries and department, this was because of the development of science and technology that made the world to move fast economically socially and politically. The government recommended the formulation of the national policy that will help in the implementation of the computer technology and the training programme. The first ICT policy was adopted by the country in 2003, which aimed to achieve the national development goals of 2025. Another ICT policy was introduced by the ministry of education in 2007 which aimed to integrate ICT in primary education to ensure that the provided education will be quality and relevance to worldwide education (URT, 2007).

In order to achieve the 2025 education goals, among the PEDP objectives was to implement Information Communication and Technology in the primary education, that could help to improve quality of teaching and learning in Tanzanian primary schools and to ensure child friendly learning in all children for pre-primary and primary schools. The planned activities were to display laptops in one hundred model schools in 2013 and 2014. In 2014 -15 the ICT approved, and the implementation plan develop the ICT equipment with digital educational materials used in classroom and teacher education in 20,000 schools following an ICT strategy paper and 15000 teachers was to be trained on ICT use and development. the study done to assess the monitoring and maintenances suggest that the assessment on the use of ICT in primary schools to be studied.

Furthermore, in 2015-16, the 502 model primary schools were operating multimedia classes following the ICT teaching and learning strategies. The ICT equipment's with digital materials were used in classes during teaching and learning and the teachers must be assessed on how they use ICT in delivering materials in the classes. Moreover, in 2016-17 the ICT study conducted to assess the effectiveness usage of ICT in teaching and learning found the model schools have operating multimedia classes and several teachers have been trained to integrate ICT in primary education. the conducted study proposed that, future research should be conducted on the assessment of the usage of ICT in teaching and learning in primary schools.

The Tanzanian government's efforts are to make sure that, the given education should go hand to hand with the development of science and technology. Studies have been done about the implementation of the ICT policy in Tanzania primary education show that, still there are challenges in the usage of ICT in teaching and learning primary education. Some schools have the ICT instruments but still, they are not using them in the teaching and learning process because they are faced by challenges such as poor management of the ICT equipment, unstable network, lack of ICT experts and unstable electricity. Santrock (2009) argues that, using information communication and technology in the teaching and learning process in Tanzania primary schools, creates individual activeness in participation and create confidence between the teachers and the learners. Therefore, the twenty first century

Tanzanian primary teachers need integration of ICT in teaching and learning in order to manage the global rapidly science and technology development. Primary education is the foundation of all other level of education, therefore, the Tanzanian curriculum for primary school's education includes ICT as a subject that contains global skills but also the ICT integration in all other subjects that should be known by any pupil of the twenty centuries.

Moving quickly with the world development, the use of multi-media classroom is offered in different primary schools in Tanzania. Laptops and desktops computer are implemented in Primary schools in Tanzania that can be connected to the Wi-Fi, GPS and NNGPS that they can access to e-learning resources. The ICT programme and strategy has been developed in order to provide further way in implementing ICT Plan in many Tanzanian primary schools with the multi-media classrooms as the aim of finalising objectives of PE¹DP3. Several initiatives are currently being implementing to train teachers and administrators how to use ICT in primary education. For example, the Education for Empowerment, Rotary ClubUK, Bright Education Trust Fund, which plan to provide renovation and build new computers classes in primary schools, educational information, resources and services (e.g. Tanzania Education Services), pedagogical and subject support to primary teachers (e.g. SPIDER, OUT, UDSM, NoPC, MoEVT) and to pilot the use of mobile phones in training teachers to deliver Mathematics and Science content (Unwin 2005).

Apart from that, CAM²ARA learning Academy and i-knowledge³ in association with Avanti Communications PLC are supporting Tanzanian primary schools by implementing ICT labs and internet to facilitate teaching and learning in primary education. They provide Education on how to use computer technology in teaching

¹ PEDP the Primary Education Development Plan is the programme that aims to provide real opportunity for all Tanzanian's to access decent primary education as aa major component of Tanzanians fight for poverty.

²CAMARA education Tanzania is a part of International Educational NGO dedicated to delivering real impact through technology by inspiring and empowering a young generation to improve their own life opportunities.

³ I-knowledge is a project that brings digital classrooms to primary and secondary schools in Tanzania, changing the lives of students and teachers across the country. The project is led by Avanti Communications which has, deployed high-speed satellite broadband connectivity to Tanzanian schools.

and learning, laptops and internet tools and this is done in almost three hundred primary schools in Tanzania by i-knowledge, CAMARA education, Avant and other donors (Smeets, 2005)⁴. The provided education includes study workshop and seminars, leading, training (development of digital TLM), and computers, multimedia projector, sound system, screen, furniture, software, networking, and others instrument which were provided in all model public primary schools included some schools in the remoteness areas.

Moreover, Bridgeit project which was established by The International Youth Foundation and the Ministry of Education and Vocational Training (MoEVT) in September 2007 through donations from the United States Agency for International Development (USAID) is among the projects that conduct computer projects in Tanzanian primary schools. The project is currently operating in few selected schools in seven Tanzanian regions, namely: Lindi, Mtwara, Pwani, Dar es Salaam, Tanga, Dodoma and Kilimanjaro. The project has installed downloaded videos via Nokia N95 cellular phones which are connected to Televisions in the classrooms for viewing teaching and learning materials during the classes. This technology is very useful especially for remoteness areas where teaching-learning resources are limited (Foundation 2007).

The ICT competence standards for primary school teachers was introduced in 2011 as first version and May to July 2015. These trainings were intended to serve as comprehensive ICT training standards for teachers in Tanzania to become instrumental in improving teaching and learning (UNESCO, 2015). Teachers' believe that in-service and pre-service training will bring changes in teachers' knowledge, skills, understanding and commitment in the work of teaching and learning (Congo, 2004; Haule, 2007).

A study done by UNESCO (2015) argue that, the introduction of ICT curriculum in primary schools in 2005 by the MoEVT in Tanzania made ICT as a separate subject for primary school students. This is addressed as a challenge in the ICT

CAMARA education Tanzania is a part of International Educational NGO dedicated to delivering real impact through technology by inspiring and empowering a young generation to improve their own life opportunities.

implementation. Also, UNESCO (2015), addressed limited ICT competency among teachers, lack of comprehensive ICT training for teachers who are teaching ICT and those who are integrating ICT with other subjects as challenges facing ICT in the teaching and learning. According to Khan et al (2012) lack of awareness on the ICT implementation of competence-based teaching and learning approaches and ability of the primary teacher. Another study done by Wachira and Swarts (2010) discovered lack of pedagogical knowledge in ICT is a problem in ICT implementation. Another study done by Mpuyanga (2017) explored the implementation of competence based in ICT teaching and learning. Most of the studies done explored more on the challenges facing ICT implementation and few stated about the usage of ICT in secondary education.

Despite the efforts done by the Government of Tanzania to implement ICT in primary education system there are number of challenges that need to be identified and hence be combated to facilitate the use of ICT in the education system starting from the primary level to higher level of education. For example, some studies in Tanzania show that, primary teachers use ICT, however, it is evident that ICT is rarely used in teaching and learning because challenges like lack of computer skills and knowledge as well as few teachings and learning computer instruments and conducive environment (Unwin, 2005).

1.3 Statement of the Problem

According to Pale (2005) 21st century is already the age of knowledge so every nation is on the process of producing a knowledgeable society by introducing industrial economy. ICT has brought a variety of new strengths in education such as electronic learning, distance education, virtual classrooms, simple teaching and learning methodologies. The developed countries already have implements ICT in their education system which is used as the part of education in teaching and learning. All education facilities like teaching and learning materials are easily available online through different programmes which are supporting teaching and learning process.

The main goals of PEDP in Tanzania is to improve teaching and learning to get quality and equity education throughout the education system that can shape children as the future workers and government leaders to become super agents economically, socially and politically. In order to reach the organised goals, the government in collaboration with the ministry of education prepared and Implements ICT program in primary education to make sure that the provided education is quality (World Bank 2011).

The study by Pale (2005) discovered that, the use of ICT in primary education can have supportive functions in administration and technical support which are necessary in today's education. For instance ICT can be used in students' enrolment, scheduling classes, preparing exercises, test, examinations and results for pupils. Not only that but also ICT can be teaching and learning assistance that is due to the ICTs functions which provide supports in the teaching and learning. ICT contained resources and system that make teaching and learning to be quicker and easier, better focused wider and deeper that improve the understanding and mastering of knowledge and skills.

ICT usage in primary education is still little due to the lack of experts, ICT facilities, and the pedagogical knowledge such as how to use ICT in other subjects. Likewise, the study conducted by different researchers show that still there is incompetence usage of ICT in primary education (Barakabitze et al. 2015, Nihuka and Florence, 2014). Therefore, this study aimed to explore the information about the effective usage of ICT in teaching and learning in Public primary schools.

1.4 Objectives of the Study

Generally, the study's intention was to explore information on the effective usage of ICT in teaching and learning in Tanzanian public primary schools' education. To be specific, the study intended to:

1. To identify the roles of ICT in teaching and learning process in public primary schools in Morogoro municipality.
2. To find factors influencing usage of ICT to make effective teaching and learning in Morogoro Municipality Public Primary schools.

3. To search challenges of using ICT in teaching and learning in Morogoro Municipality Public Primary schools.

1.5 Research Questions

1. How do Public primary school teachers of Morogoro Municipality apply ICT in teaching and learning?
2. What motivates primary school teachers of Morogoro Municipality, to use ICT in delivering materials during interaction?
3. Do public primary schools' teachers of Morogoro Municipality face problems while using ICT in teaching and learning?

1.6 Significance of the Study

The study will be useful to the policy intervention because the implication of the study can be used to strengthening the existing policy to assure the effective usage of ICT in primary education. The obtained information also will be used by the school administrators, educational leaders, primary school teachers, pupils and other education stakeholders to promote the integration of ICT in primary education.

1.7 Delimitation of the Study

The study focused on assessing the usage of ICT in teaching and learning in public primary schools. Morogoro Municipality has public and private primary schools, but the study was conducted in the three selected primary schools which are under the program of ICT implementation. Therefore, generalization is limited due to the area of study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter on the reviews what has been done by other researchers which are related to the usage of Information and Communication Technology in public primary schools. Similar sources such as reports, books, local and internal journals as well as internet was used to show the relationship with the study. The aim of reviewing these literatures is to conceptualise terms which were used in this study as theoretical and empirical studies related to the usage of ICT in teaching and learning in the public primary schools.

2.2 Theoretical Literature Review

Lengthening skills and knowledge on assessing the usage of ICT in teaching and learning in public primary schools acceptable selected literature will be reviewed to show the relationship of the current study and the previous studies. This unit ends with conceptualisation of terms used in this study especially theories of using ICT in primary education.

2.2.1 Individual acceptance and adoption of ICT Theory

The study was guided by the theory of individual acceptance and the adoption of Information and Communication Technology. The theory indicates that, Individual's characteristics such as gender, motivation, experience, age, subject norms, trialability, compatibility and complexity play a large party to learn and use new technology like ICT. Moreover, studies proved that the social influence and the cognitive instrumental process can be the factor that influences individual use of ICT in teaching and learning. For example, the research done by Venkatesh and Davis (2000) who used TAM and TPB revealed that, social influence processes and cognitive instrumental processes also can develop the individual acceptance in the use of technology. Extensionally, the professional of innovative and exciting information technology applications that target individual professions has made the examinations and re-examination of existing of existing technology acceptance

theories and model in professional setting increasingly important (Chau and Hu 2001).

2.2.2 Information and Communication Technology

According to Acara (2010), there are many definitions that gives the complete meaning of the information and communication technology. Additionally, ICT is viewed as a specific terminology that is constantly growing and changing depending on the technology and information advancement. URT (2007) defined ICT as commonly term used to all forms of technology that are used for communication and to transmit, store, create, share or exchange information. Moreover, URT added that, the wide definition of ICT comprises technologies such as radio, television, video, telephone, computer and network hardware and software also the equipment and services related with those technologies such as electronic mail text messaging and radio broad casting. Furthermore, Danner (2003) comments that, the position of technology in people lives is unimaginable and it is envisaged that technologically knowledge will become the main important requirement for human being's academic achievement, social-economic and personal needs. Implementing ICT in primary education will be useful since the pupil will get the skills easily and this will help to satisfy human needs in especially in this world of globalization.

2.2.3 CT Competence in Primary Education

The key idea in designing and introducing quality teaching and learning methodologies in primary education is though ICT competence. Sullivan et al. (1998) argue that, competence is the ability to perform a skill to a specific standard and apply the appropriate knowledge and altitudes to achieve best job, performance in school or world of work. The Tanzanian primary schools' syllabus includes ICT competence in which aims to help the pupils to achieve knowledge when investigating, creating good relationship with other learners. This can be done through electronic communication like emails (URT, 2007).

Usage of ICT in primary schools is growing for pupils because ICT is a means for actual learning and teaching methodology since it allows all learners to create good relationship and make the class active. Mceetya (2008) said, to be an effective

learner at school and beyond, a pupil needs to become creative and productive users of computer technology. So, ICT is the main tool that can convert primary school learners to the way that they can think and be creative in academic issues and other important skills on the worldwide. The primary school pupils can develop capability in using ICT when ICT is created and well used to transfer skills and knowledge from learning environment to another social context such as problem solving, communication and reasoning (Acara, 2010).

A primary school pupil can develop competence when there is correct use of teaching and learning materials. ICT is the major facilitator of the primary schools teaching and learning materials since it provides the best teaching and learning methodologies and the materials like videos, pictures and written documents. According to URT (2005) it is easy to understand the primary school pupils' competence development when the pupil can do the following:- to use picture, drawings and symbols and signals in communication, attentive, to use cellular phones, using traditional ways of communication, using electronic library in teaching and learning, using media like emails in communication and socialization, using computer in the first level like using Microsoft word and excel while working in the class rooms as well as using internet in the process of teaching and learning inside and outside the class.

2.2.4 ICT as a Subject in Primary Education

ICT is having very important function in building economy and national development in the developing countries like Tanzania. These new evolving technological changes have made services empowered by ICT a pre-requisite for development of the education sector since ICT help teachers, pupils and school administrators to share and exchange information and knowledge (Davidson 2004). ICT is vital for the supportable development of education particularly in developing countries like Tanzania where awareness and development are still taking place after independence. The guidelines of World Bank and UNESCO, numerous of developing countries have framed and implement ICT Policy for primary education. The ICT Policy for Basic Education 2007 is a set of guidelines that makes Tanzania to be in the position of the universal level in which the ICT will be implemented in education from Pre-primary and primary schools up to the higher learning

institutions as well as the vocational education. The main motivation in drawing this policy is through the transformation of ICT knowledge and skills into Tanzanian primary education system (Harshey, 2015).

2.3 Empirical Literature Review

2.3.1 Roles of ICT in Teaching and Learning

ICT is an electronic means of capturing, processing, storing, communicating information. The use of ICT in the classroom teaching-learning is very important because it provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning. Moreover, the use of ICT creates self-responsibility for learning such as distance learning, motivate teachers and students to continue using learning outside school hours, plan and prepare lessons and design materials such as lesson content delivery and facilitate sharing of resources, expertise and advice. ICT is very useful as it is included into the primary education curriculum to help pupils to get the ICT knowledge while they are still young (Sharma, Gandhar, Sameer, and Seema 2011).

Several studies such as Cavas et al. (2009), argue that, the use of new technologies in the classroom is essential for providing opportunities for students to learn and to operate in an information age. ICT creates conducive environment for teaching and learning as it facilitates teaching for teachers can use ICT devices as teaching aid to the lesson and makes learners grasp knowledge easily. Teacher can display materials through projector for students to see and learn, for junior scholars, teachers can display pictures, and any audio-visual material to make the class interactive and raise pupils' interest. Schools who incorporate the use of new technologies prepare their learners for life in the twenty first century. Thus, ICT can effectively improve teaching and learning environment and abilities hence increase learners, performance.

With ICT in schools, delivery time is minimized as well as study time. ICT makes easy the process of teaching and learning as it facilitates availability of materials within short time, so it reduces time of hunting for study materials. Both teachers and learners time is saved thus they can have plenty time for doing other activities. A

teacher can upload pupils' information as well as performance within few minutes and save time for other activities such preparation of timetable and relevant teaching and learning materials. Different studies proved that, the use of ICT in teaching and learning in Primary education help the teachers to save time (Jugran 2009).

A study conducted by Sara, Kenneth and Sue (2015) argue that, the use of ICT in primary education helps to save time because it is easy to get teaching and learning materials like books, videos, pictures and other documents that help pupils to easily understand the lesson. For example, the use of internet in downloading teaching and learning picture and videos that helps the teacher to not keep on using much time in explaining the concepts. Before the introduction of ICT, some teachers were concerned that they need to spend much time with pupils helping them to understand different concepts, but ICT skills help them to get teaching and learning materials that help the pupils to catch up the subjects. Thus, decreasing the amount of time, that they can spend explaining subject specific concepts, ICT tends to be the best way of teaching that make pupils with low understand to participate and enjoy the lesson simply.

ICT makes availability of teaching and learning materials. Materials such as handouts, pictures, graphs and other writings are made available to teachers and learners. With ICT devices, teachers and learners can use internet to search for materials online, there are books, journals, articles and the like which are necessary for teaching and learning. Materials are also exchanged and communicated from one person to another, institution with others through emails, live charts and conferencing (Omwenga, Waema, and Eisendrath, 2002).

More evidence can be found in English and Science subjects were teachers claimed to be more confident while using ICT in teaching and learning because before the teachers lacked teaching and learning materials that could support the teaching and learning classes. The knowledge of using ICT in primary education makes the teachers to have quality teaching and learning materials which make the teacher to create confidence when they are teaching in the class. Also, the pupils can participate in the lesson because the use of teaching and learning aids from the ICT help the

pupils to create confidence and as well as they can create confidence in asking and answering the questions. Teachers who lacked the supportive teaching and learning facilities are much enjoying teaching using ICT facilities, and they are competent that the experienced teachers although the experienced teachers possess a many teaching and learning approaches (Sara, Kenneth and Sue 2015).

2.3.2 Factors Influence the Use of ICT in Primary Education

There are many factors influencing the usage of ICT to make teaching-learning effective in primary schools of Tanzania. Teachers' attitudes on the ICT integration is the one of the factors can either influence or discourage the usage of ICT in primary schools. Attitude is a predisposition to respond favourably or unfavourably to an object, person, or event (Ajzen, 1988). To successfully initiate and implement educational technology in schools' program depends strongly on teachers' support and attitudes. Among the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology (Hew and Brush, 2007). If teachers' attitudes are positive toward the use of educational technology, they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. The strong relationship between computer related attitudes and computer use in education has been emphasized in many studies, attitudes toward computers influence teachers' acceptance of the usefulness of technology, and influence whether teachers integrate ICT into their classroom sessions.

In order to have effective teaching and learning through ICT, the ICT devices must be available in school environment. For example, computer machines, internet, satellite dishes, computer lab and other important tools in teaching and learning through ICT. ICT is an electronic means of capturing, processing, storing, communicating information. The use of ICT in the classroom teaching-learning is very important for it provides opportunities for teachers and students to operate, store, operate, and retrieve information, encourage independent and active learning, and self-responsibility for learning such as distance learning, motivate teachers and students to continue using learning outside school hours, plan and prepare lessons and design materials such as course content delivery and facilitate sharing of

resources, expertise and advice. For any school to succeed in doing the mentioned above, the school must have the useful or effective ICT devices (Guma, Faruque and Khushi 2013).

ICT competence is another factor that influences the usage of ICT in teaching and learning. According to Tondeur, Valcke, and Van (2008) Computer competence is defined as being able to handle a wide range of varying computer applications for various purposes. Teachers' computer competence is a major predictor of integrating ICT in teaching process, this is evidenced in Bordbar (2010) that the skills teachers have on computer assisted devices enable them to use ICT in their daily teaching unlike those who are ICT illiterate. Evidence suggests that majority of teachers who reported negative or neutral attitude towards the integration of ICT into teaching and learning processes lacked knowledge and skills that would allow them to make "informed decision". According to Peralta and Costa (2007), teachers with more experience with computers have greater confidence in their ability to use them effectively. Lack of expertise in ICT results to low usage of ICT in teaching and learning Confidence also relate to their perceptions of their ability to use computers in the classroom, particularly in relation to their pupils' perceived competence.

Peralta and Costa (2007) observe that individuals with less than upper-secondary education are significantly less likely to use computers for a range of purposes. In addition, scales that measure individuals' use of computers and the internet and attitudes toward computers, tend to increase with the literacy proficiency of individuals. According to the National Centre on Adult Literacy Technical Report (2005) one study in Britain found that people with more education have higher ICT skills but suggests that more educated people tend to work with computers, making it difficult to differentiate whether education or employment has the biggest impact on ICT skill levels. It is thus found that education levels of primary school teachers influence their interest and ability to use ICT in their teaching, therefore those with post-secondary education seem to have more frequency usage than those with lower education.

Access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education (Plomp, Anderson, Law, and Quale, 2009). Effective adoption and integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware, software, etc. Obviously, if teachers cannot access ICT resources, then they will not use them. Therefore, access to computers, updated software and hardware are key elements to successful adoption and integration of technology. A study by Yildirim, (2007) found that access to technological resources is one of the effective ways to teachers' pedagogical use of ICT in teaching.

According to Volman and van Eck, (2001) Gender differences and the use of ICT have been reported in several studies. However, studies concerning teachers' gender and ICT use have cited female teachers' low levels of computer use due to their limited technology access, skill, and interest. Research studies revealed that male teachers used more ICT in their teaching and learning processes than female teachers. Jamieson-Proctor, Burnett, Finger, and Watson, (2006), conducted a research on teachers' integration of ICT in schools in Queensland State. Results from 929 teachers indicated that female teachers were using ICT in their teaching and learning in primary schools less than male teachers. In a research conducted by Kay (2006) found that male teachers had relatively higher levels of computer attitude and ability before computer implementation, but there was no difference between males and females regarding computer attitude and ability after the implementation of the technology. He claims that quality preparation on technology can help lessen gender inequalities.

According to Williams (2004), one of the strongest factors between schools in teachers' use of technology is the perceived pressure to use technology. Pressure to use technology shows that teachers feel the expectation from others to use technology in classrooms. As technologies grow, teachers continue to be faced with increasing pressure to integrate technology into their classes during teaching and learning. Thus, it is important for teachers to know how to use computer technology that they can cope effectively with the pressure since the teacher is the key to effective integrated technology in classrooms during teaching and learning.

Another study done by Russell, Bebell, Dwyer, and Connor (2003), found that, teachers are much attentive in the use of technology during the classes. Having their pupils while using technology during class time, help to create quality products using technology, and to a smaller degree, use technology for class preparation. In the use, support, and effect of instructional technology (USEIT) study, the perceived pressure to use technology is positively associated with teachers' technology use for transporting instruction in teaching and learning in primary schools, for creating products, and for class preparation. For example, Ertmer (2005) insists that if teachers feel pressured to change their pedagogy in order to accommodate new technologies, they are more likely to resist adopting technology totally and this will make effective teaching and learning with quality performance.

Government policy and support is another important factor on the influence of ICT usage in primary education. Policy and planning are important in identifying the aims of using ICT in education and in determining priorities in allocating resources (Omwenga, Waema, and Eisendrath, 2002). He further points out that education authorities and the centres for which they are responsible have key tasks related to enabling, implementing and monitoring the use of ICT for learning and teaching. Pressure and support from government influence ICT usage as government supply materials to schools, train teachers and improve ICT facilities such as network connectivity. Pernia (2008) points out that countries rated low on appreciation of ICT have ICT policies that merely recognize the strategic role of ICT for growth and development. Countries rated high in appreciation of ICT have ICT policies that go beyond measures that support ICT initiatives, for instance Australia, Malaysia and Japan.

2.3.3 Challenges of ICT in Public Primary Schools

According to Hare (2007), there is inadequate national ICT and electricity infrastructure especially in the rural areas. The telecommunication network is limited to the main cities and internet access costs are still high making it difficult for schools and other educational institutions to access or afford internet access. However, the telecommunications infrastructure in the country is improving rapidly in capacity and reach. And while Tanzania recorded enormous growth in mobile

subscriptions, education has not yet tapped into this technology to deliver services especially to the rural communities who have remained underserved owing to the challenges of cost, electricity and connectivity. The limited electricity supply network also greatly hinders the deployment of ICT to schools especially in the semi-urban and rural areas.

Teacher's perception on the use of ICT in Teaching and learning in primary schools is a challenge in meeting the goals of the government and the ministry of education for primary schools. Although Tanzanian government has been investigating in the integration of ICT in primary schools, what is known by the teachers about ICT is very little. A study done to examine the teacher's perceptions about the use of ICT in teaching and learning, administration professional development and personal use indicates that while the frequency of use of ICT was influenced by access, the competence of ICT use was influenced by training for teachers. Teachers used ICT in wide range for teaching, administration, professional development and personal use especially during the training. However, they do not use ICT to radically change their pedagogical practice, but rather to sustain their traditional practices (Mwalongo, 2012).

Another study done by Omwenga, Waema, and Eisendrath (2002), Shows that the limited capacity throughout the system and especially from the MoEVT is a challenge in the ICT integration in primary education: The capacity constraints include lack of coordination of ICT in education activities for example; the Tanzanian public primary schools use Kiswahili language as the medium of instruction, there are no enough computer experts in public primary schools so it is difficult for Kiswahili language teacher to use ICT in teaching and learning due to the language used in the computer programmers. Due to limited information sharing, limited skills for integration of ICT in education most of primary school teachers have no knowledge to interpret computer knowledge. The ineffective organizational structures at the various primary education management levels to accommodate ICT integration in teaching and learning in primary schools, lack of incentives and schemes of service for ICT trained personnel to reduce attrition, and resource constraints.

A study done by Wachira and Swarts (2010) show that absence of an end-to-end strategy, successful and effective use of ICT requires government's focus on all the elements of an end-to-end system that include the technology, electronic content and curriculum integration, maintenance and support, teacher training and monitoring and evaluation. Lack of fund makes the failure of the government to make the follow up if the implemented projects in primary schools are well conducted by the education leaders. Soon after the implementation of the projects, the primary school leaders found themselves in difficulties while conducting the projects. For example, it is not easy for school to manage electricity payments, computer maintenance and teachers training due to fund problems.

Different Researchers had point out the limited resources include computers, electricity and quality classes. Most of the primary schools are still in poor condition classes; the classrooms lack windows, doors and they are full of dust because of the environment nature so this makes difficult to implements the ICT. A study done by Mendes, Tuijnman and Young (2003) show that there is less emphasis on ICT training in primary schools in Tanzania because of limited resources. Additionally, other studies point that most of the schools that teach computer skills are private schools and for the government they are very few because the government is not able to implement ICT in all public primary schools (Senzige & Sarukesi 2004). This means the government has failed to provide computers for the public schools and training the teachers as the education policy and its objectives state. This is because of poor planning and monitoring of ICT projects in the few primary schools; that after the implementation there is no serious follow up of the projects from the government and the ministry of education. Additionally, those teachers taken for the computer maintenance failed to give back the knowledge to other teachers because they do not have teaching and learning instruments. The schools lack important things like ICT toolbox, wind blower and other tools used to open computers for maintenance (Senzige & Sarukesi 2003).

2.4 Research Gap

Research done in Nigeria by Badau & Sakiyo (2013) found out there was little competence in ICT integration in primary education although ICT implementations were introduced in Nigeria by UNESCO in 2008. Additionally, the study state that the method used in teaching and learning in primary schools still based on traditional methods and this show the teachers do not have enough knowledge in how to integrate ICT in teaching and learning.

Studies showed the challenges of integrating ICT in primary education, ICT implementation in primary education and competence in primary education. The study conducted by UNESCO (2012) found that despite the teaching and learning environment of primary schools that support the innovation and transition to modern technology system, most of the subjects are taught without ICT. The studies show that still there is a problem in the use of ICT in primary education. Another study argues that the successful implementation of ICT curriculum on primary schools should involve assessments of the impacts of new introduced pedagogical approaches on students' learning results (Pelgrum & Law, 2003).

A recent study conducted in Morogoro Municipality show that teachers with bachelor's degree are more interested on using their own personal computers, but the challenge was how to connect with internet and downloads teaching and learning materials. The study comments that, teachers were given training by i-knowledge program but still there is a problem on the use of ICT because the training was for a short time and teacher were not able to catch up everything (Kira, 2016). Another study reveal that the primary teachers have positive mind on the use of ICT, but the problem is how to get the teaching and learning materials from the internet and use them in teaching and learning (Kihoya et al. 2016).

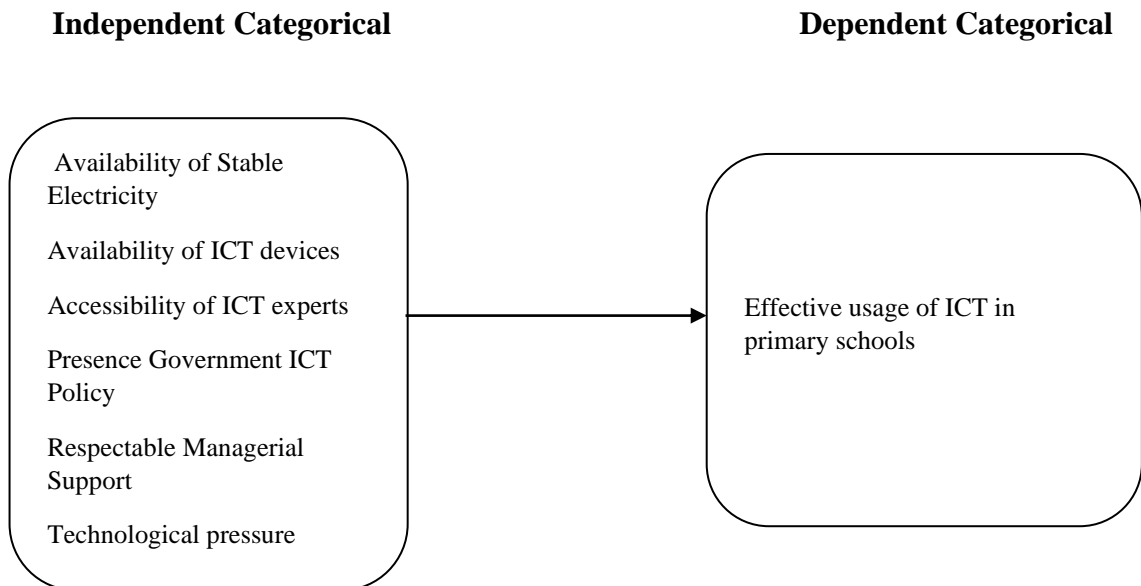
UNESCO 2017 insisted the usage of ICT in Tanzanian primary schools by providing tablets for pupils as the solution to bring back pupils who have run away the school due to different violation caused by poverty (Gallagher, 2017).

Studies reviewed show the implementation of ICT in primary Education, challenges of ICT implementation in Primary schools, factors influencing the implementation of ICT in teaching and learning in primary education, teachers' perception on using ICT but they did not touch the integration of ICT in teaching and learning. Therefore, this study intends to fill the gap of the usage of ICT in teaching and learning in Public Primary schools of Morogoro Municipality.

2.5 Conceptual Framework

Conceptual framework is visual presentation of variables of the study. It shows relationships between concepts which frame the main theme of the study. The conceptual framework of this study is divided into two, independent and dependent variables. Dependent variable is the one which is being caused or the result of other variables, in this study dependent variable is the ICT usage in primary schools. Independent variables are those which can stand alone, these are electricity power, ICT devices like computers, ICT experts, managerial support and technological support.

Figure 2.1 Conceptual Framework



Source: different reviewed literature.

The figure above shows the usage of ICT in primary education as the main factor, depends on factors which are availability of electricity that operate computer and other ICT devices, ICT experts who deal with maintenance and provide ICT knowledge to the teachers, the government Policy which used to support ICT implementation. Moreover, management support motivates teachers to practise ICT in teaching and learning, while technological pressure raised teachers' and pupils' interest of using ICT in teaching and learning.

This study has revealed that there are factors that motivate the usage of ICT in public primary schools though there are some obstacles. During the interview and FGD for data collection, the researcher experienced that Public primary school teachers and the pupils are inspired to use ICT in teaching and learning if electricity is available. When electricity cut off, it is difficult for teachers to integrate ICT in teaching and learning. Availability of ICT devices has changed primary school management and teachers' lifestyle. This means teachers are using ICT in teaching and learning which is the easiest way of delivering materials to the learners and the ICT experts make sure that the school computers systems are working well to assure quality education to the pupils.

Consequently, the usage of ICT in primary schools is being affected by factors such as overloaded materials from the internet can confuse teachers and the pupils if the materials are not well filtered. Moreover, poor electricity, scarcity of ICT equipment, ICT equipment theft and low knowledge on ICT are the obstacle that lead to the poor integration of ICT in primary education. Through documents reviewed the researcher revealed that there is no proper management of the ICT equipment in the schools.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter presents the methodology on how the research was done. The areas presented are; the area of the study, research paradigms and approaches, research design and techniques, data types, target population and sampling design, data collection methods, data analysis, validity and reliability, Ethical issues and chapter summary.

3.2 Research Approach and Design

In the study, the researcher adopted qualitative research approach because it can provide detailed information about the effective usage of information and communication technology in primary education. The decision to use this approach was based on the nature of data which were collected through interview and focus group discussion. Moreover, qualitative is the holistic approach that can meet the individuals and share their feeling through interview and focus group discussion to get the quality data about the effective usage of Information and Communication Technology in public primary schools in Morogoro Municipality.

3.2.1 Research Paradigm

The researcher's philosophical stand was constructivism believing that reality can be found through individual and social viewpoints. This research paradigm was fit for collected information because the study was qualitative in nature and it intended to assess the effective usage of ICT in Public primary schools. Constructivists believe that reality is constructed by social actors and people's perceptions of it. They recognize that individuals with their own varied backgrounds, assumptions and experiences contribute to the on-going construction of reality existing in their broader social context through social interaction (Wahyuni, 2012).

3.2.2 Research Design

Research design is the plan showing the approach and strategy of investigation aimed at obtaining relevant data, which accomplishes the research objectives (Cohen, Manion and Morrison, 2007). This study applied explanatory case study design because the study needed detailed information focusing on the effective usage of information and communication technology in Morogoro Municipality Public primary schools. Data were collected using focus group discussion, individual interview and document review that help to get inner information about the effective usage of ICT in public primary schools of Morogoro Municipality.

3.3 Population of the Study

According to Kothari, (2004) population refers to the total number of the items about which information is desired. The targeted population for this study included the total number of all Public Primary schools in Morogoro Municipality which is sixty-four Public Primary schools and specifically the study was conducted in the selected three Public Primary schools with ICT implementation program in Morogoro Municipality.

3.3.1 Area of Study

The study was conducted in Morogoro Municipality in three selected public primary schools. The district has sixty-four public primary schools and Seventeen Primary schools are in the project of ICT implementation by CAMARA education in Tanzania and i-knowledge. The schools were selected since, they are in the ICT project, also the pupils' enrolment number was considered as a selection criterion. The number of pupils in the selected schools was high, medium and the low number of pupils' enrolment. Moreover, the selected schools have online programme known My Maarifa used by pupils and teachers in teaching and learning and online group discussion.

3.4 Sample size and Sampling Techniques

A sampling design is a definite plan for obtaining a sample from a given population. Best and Khan, (2006) refer to sampling design as the technique or the procedure the researcher would adopt in selecting items for the sample. To ensure samples are

equally selected from the population the study employ probability and non-probability sampling design in data collection since all respondents have equal chance to participate.

3.4.1 Selection of study participants

Saunders, Lewis and Thornhill, (2009) have suggested that sampling techniques provide a range of methods that enable reducing the amount of data one need to collect by considering only data from a sub-group rather than all possible cases or elements. In this respect purposive sampling was employed to explore the case. Purposive sampling was adopted to obtain information from ICT experts within the schools and the head teachers, as it provided chance to get specific and technical information from these respondents. Also, non-probability (simple random) was employed in this research to get information from the pupils and the subject teachers.

3.4.2 Number of study participants

Best and Khan (1992) asserted that, sample is a small proportional of population that is selected for seeking data. Literature has suggested the sample size which can be taken depends on the type of the research to be undertaken and the study design. Twenty-one participants were taken from the three selected public primary schools from Morogoro Municipality, whereas twelve were pupils, three were subject teachers, three were ICT experts and last three were the head teachers.

Table 3.1: Number of study participants

Participants	Number
Head teachers	03
ICT experts	03
Subject teachers	03
Pupils (6 boys & 6 girls)	12
Total	21

Source: field data 2019

3.5 Data Collection Methods and Instruments

According to Sarantakos, (2005), a research method consists of a set of specific procedures, tools and techniques to gather and analyse data. This study employed interview and focus group discussion data collection methods.

3.5.1 Interview

The study employed semi-structured interview to gather information about the roles of ICT in teaching and learning in primary schools, what motivate teachers to use ICT and the challenges of using ICT in teaching and learning. This information was gathered from the three head teachers, three ICT experts and three subject teachers.

During the interview the researcher introduced herself to the respondents, telling them the general purpose of the study and assure the respondents about the confidentiality of the gathered information. The interview was conducted in Kiswahili language to respect that Kiswahili is used as the instruction language in all Tanzanian public primary schools.

The researcher interviewed three head teachers, three ICT experts and three subject teachers from the three selected public primary schools and their answers were recorded using the voice recorder from the smart phone. Also, some of the answers were taken as the field notes which later the researcher reviewed to get the correct information. The interview was conducted in a place where the participants choose to be, either the places were in the headteachers office, teachers office and the computer labs.

3.5.2 Focus Group Discussion

Focus group discussion was used to collect information from twelve pupils in the three sample schools. From each school four pupils were involved; two were from standard six and the other two from standard seven. The two classes were selected because they are the one whose syllabus involves much the usage of ICT. The focus group discussion was done in the computer labs and the headteachers' offices as directed by the school management. Each school had its own day for data collection as arranged by the researcher.

The researcher of this study used focus group discussion because it was considered as the useful method of collecting information from the organized discussion since it produced quick and a lot of information. During the focus group discussion, the researcher introduced herself to the pupils and told them the purpose of the study and the confidentiality of the collected information. The information was recorded by the voice recorder that can be used by the researcher for data presentation.

3.5.3 Documentary Review

During the study, the researcher reviews different documents that helped to provide information about the usage of information and communication technology in public primary schools. The reviewed documents were teachers' scheme of work and lesson plan prepared on the computer, the primary school ICT usage policy, the soft copy teaching and learning materials found in the Jukwaa la i-knowledge, my Maarifa, Tesa and Rachel. Moreover, the researcher reviewed the handover contract that shows the number of the provided computers and the most important was visiting the computer labs.

3.5.4 Types and Sources of Data

3.5.4.1 Primary Data

Primary data is a type of information that is obtained directly from first-hand sources by means of surveys, observation or experimentation (Kothari, 2004). The researcher used interview method to get primary data from subject teachers, ICT experts and the head teachers. Focus group discussion was used to get primary data from pupils of the three public primary schools involved in this study.

3.5.4.2 Secondary Data

These are data which have already been collected by someone else and they have already passed through statistical process (Atkinson & Brandolini, 2001). Different documents were reviewed to get secondary information which is relevant to the study. The researcher assessed materials prepared, uploaded and downloaded by teachers and pupils as part of teaching and learning. Moreover, the researcher reviewed the ICT policy and the handover contracts from the three selected schools.

This help to get the total number of the computers provided by the Tanzanian government in the collaboration with education donors.

3.6 Data analysis and presentation

Data analysis includes the inspection or evaluation of the information collected from the study participants with the aim of sorting them in order to get the important needed information that used to draw conclusion of the study (Sridhar 2018).

In this study the collected information through the instruments which are interview, focus group discussion and documentary review were recorded and prepared for data analysis. Data collected were analysed and presented through narration data analysis style. The researcher listened to the recorded information carefully in order to transcribe the information from audio and summarized into written documents. From the summarized texts, the researcher interpreted the information and the logical information used to generate themes and sub themes that were organised to give information about the usage of ICT in Tanzanian Public Primary schools specifically in Morogoro Municipality. Nevertheless, the information collected from documents review were analysed manual after been reviewed from the checklist of the researcher.

3.7 Addressing Issues of Validity and Reliability

According to Best and Kahn (2004), Validity is the quality of data gathering instrument or procedure that enables it to measure what it seeks to measure. To ensure validity of the collected information, data was tested by pre-testing of data collection tools, and triangulation methods were adopted to collect information from the respondents and also the researcher involved enough respondents to get sufficient information.

Cohen (2007) wrote on reliability as the instrument, is the measure of consistence over time and over similar sample. Best and Kahn (2004), maintain that, reliability is a degree of consistence that the instrument of procedure demonstrates. To collect reliable data, the researcher designed focus group discussion and interview questions. For the case of language, all respondents could use Kiswahili language to provide

information because Kiswahili is the language of instruction in all Public primary schools of Tanzania.

3.8 Ethical Considerations

To ensure ethical issues the researcher obtained the permit letter from the University of Mzumbe, another one from Morogoro Municipality director that used to introduce the researcher to the respective studied schools. Moreover, the researcher ensured confidentiality and privacy to respondents as well as seeking their consent for their participation in the study. The researcher guaranteed anonymity by concealing the individual name of the respondents as well as the organisation names. This also is suggested by the Cohen et al. (2007), Croswell (2012).

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Overview

This chapter presents findings as collected from the participants. The respondents in the study were Primary School teachers specifically head teachers, ICT experts, subject teachers and pupils of class six and seven from the three selected primary schools in Morogoro Municipality.

The findings are presented based on the research objectives which are: - to identify the roles of ICT in teaching and learning process in public primary schools in Morogoro municipality; To find factors influencing usage of ICT to make effective teaching and learning in Morogoro Municipality Public Primary schools; and to search challenges of using ICT in teaching and learning in Morogoro Municipality Public Primary schools.

In a nutshell, the chapter seeks to show how primary school teachers, head teachers, ICT experts and pupils use ICT in teaching and learning in Public Primary Schools.

Table 4.1: Social Demographic of the Characteristics of the Study Participants

Characteristics	N (%)
1. Gender	
Male	10 (48)
Female	11 (52)
2. Age of group	
10-19	12 (57)
20-29	00 (00)
30-39	06 (28)
40-49	01 (05)
50 and above	02 (10)
3. Education level of participants	
Primary school	12 (57)
Secondary education	00 (00)
Certificate	03 (14)
Diploma	04 (19)
Bachelor's degree	01 (05)
Master's degree	01 (05)
4. Teaching Experience	
01-10	02 (10)
11-20	05 (24)
21-30	00 (00)
31 and above	02 (10)

Source: field data 2019

The collected information shows the female respondents are much interested in integrating ICT in teaching and learning rather than male. On the case of age, the respondents who are below forty years old do use ICT much than those who are above forty years old. Moreover, the result indicated that experience is also a characteristic that influence teachers and pupils to integrate ICT in teaching and learning.

4.2 The Roles of ICT in Teaching and Learning in Primary Schools

The focus of this theme was to find out the roles of ICT in teaching and learning in primary schools of Morogoro Municipality. From this theme, the following sub theme were revealed; ICT used to send and receive school information, to get teaching and learning materials, teaching in overcrowded classes, to simplify teaching and learning process and teaching and learning other subjects. Data were

gathered through interview and focus group discussion and it involved nine teachers and twelve pupils from three primary schools of Morogoro Municipality.

4.2.1 Sending and Receiving School Information

Primary school teachers use ICT to send and to receive information such as teachers' attendance, number of pupils registered in school and monthly school report, are sent direct to the Regional Administration and Local Government. Teachers can communicate through emails especially when they need to send teaching and learning materials. Moreover, pupils can send and receive greetings from other pupils through emails. Online examination is another role of ICT that primary school pupils are doing online examination through internet available in their schools. Through interview with a head teacher H1 from school 'A', said that: -

ICT equipment are used to send and receive school information such as teachers and pupils school attendance, monthly school reports and pupils' registration number to the Regional Administration and Local Government. We use Kishikwambi (tablet) and we connect it with WIFI which is found in our school and then we send the information directly to the Regional Administrator and Local Government.

Teacher M3 from school C through interview said:

I use ICT not only for teaching aids but mostly for sending and receiving information. For example, I am teaching English and sometimes I might have a problem in teaching a certain topic, I send an email to a teacher of another school to get help on the topic, either by instructing me how to teach or by coming and teach as a visitor.

Through focus group discussion pupil 2 from school B said that:

I communicate with my friends in this school and others from the neighbour schools through emails. I can chat with friends asking them questions about the topic that is difficult for me to understand and I get answers through pupils' communicative program on Jukwaa la iknowledge.

4.2.2 ICT is a Source of Teaching and Learning Materials

Internet has simplified the teaching and learning process by providing teaching aids that are quality and fit all topics that must be taught, and the teaching aids are found within a short time. Before having internet, primary teacher used to prepare teaching aids themselves, and that took time to be completed and sometimes they must buy

teaching aids. Since they have Internet, it is easy to get videos from Ubongo kids and You Tube and picture for teaching and learning. Due to the curriculum development there are changes of topic to be taught, most of primary schools were faced by deficiency of teaching and learning textbooks and supplementary books. The presence of internet in primary schools has overcome this problem by providing soft copy books that can be downloaded from the internet and being used in teaching and learning while waiting for the hard copy books. Teacher E3 who is an ICT expert from school C reported this when was interviewed by the researcher.

To be frankly, internet has been a solution of teaching and learning aids and books, for example, we have this problem of textbooks due to the curriculum change. When there are changes in curriculum the teaching and learning materials like textbooks are not brought on time. Sometimes they may arrive in two or three months after the schools have been opened. Teachers suffered a lot to get teaching books. Since we have internet in our schools the problem is no longer there. We just download the softcopy and start to teach until the hard copies arrived.

Through interview teacher M1 from school A said: -

Since we have internet connection in our school, I use my smart phone to search teaching and learning materials. For example, I am teaching Kiswahili language and most of teaching materials I got from internet through my smartphone. Out of getting materials for teaching I also go to google learning other things like how to connect laptop and projector, how to manage overcrowded classes using ICT equipment.

Apart from that, we have programs like My Maarifa where teachers from different schools meet online and discuss topics especially those which are difficult to teach. From the school computers there are Wikipedia, Tesa, Rechal, Tetea maktaba, Elimu kwanza, ubongo kids and Camara Learning Academy, available in jukwaa la iknowledge that can be used in taching and learning.

Through document review the researcher observed that, there are teaching and learning textbooks which are soft copy materials in the school computers. The reviewed documents were softcopies of textbooks, supplementary books, and other materials like videos from the YouTube, Ubongo kids as well as pictures that used as teaching and learning aids. The available teaching and learning materials are fit for pupils of each level.

4.2.3 Using Projector in Overcrowded Classes

Projector helps teachers in teaching and learning overcrowded classes. Teachers who use projector do never talk much in teaching and learning especially in overcrowded classes because most of the explanations are done in the videos and pictures. This makes the pupils to understand well rather than those who do not use projector. Using projector makes more understanding since it nearly to practical. For example, a pupil can see the historical sites, the rocks, mountains by using the pictures or videos from You Tube. When the teacher uses projectors, it makes easy to the pupils to understand the lesson because they pay attention. This was revealed by the researcher as a teacher E2 from school B said that: -

Projector is the main solution for overcrowded classes here in my school. For example, I am teaching science subject to more than eighty pupils and it is difficult to write all the notice on the chalk board. For sure it is difficult for the pupils to have attention and learn, so I prepare my slides in a laptop and then I go to class and project them on the whiteboard. This helps me to control the class because the pupils pay attention watching the videos or picture and later, they copy notes from the slides. This is the best way of teaching because they understand more than teaching on the blackboard without pictures and videos.

4.2.4 ICT Simplifies Teaching and Learning

Primary teachers used to prepare lesson plans, scheme of work and lesson notes by handwriting. Sometimes it was difficult for a teacher to get the old documents because, soon after been finished the lesson plans are thrown away that it was not easy for a teacher to find a lesson plan or scheme of work of the past years. Also, teacher must repeat the preparation of lesson notes, scheme of work and the lesson plan each year or each semester but after having the computers, the problem is no longer there. Teacher can review the past years documents as they are effortlessly available in the school computers. Not only that, but also the school examinations and monthly tests are done through the school computers and the pupils' continuous assessments are stored in the school computers where they can be reviewed simply. This was revealed by the researcher through interview with H2 who the head teacher from school B is as said: -

Before having ICT facilities, we had a hard time especially in reviewing documents in order to prepare lesson plans, scheme of work and office reports. Also, we used a lot of money to make copies for scheme of work and lesson plan. The most troubling headache was the pupils' terminal and annual examinations that cost a lot of money now this problem is solved through ICT. We print all documents here in our school and we can have number of copies as many as we want.

Moreover, when the researcher interviewed the teacher E1 who is the ICT expert from school A about the examination issue, the teacher said that:

Academically, this helps to escape the recurrence of the examination or some questions. Teachers can prepare the examination on their own time even while they are at home and keep the exams until the examination day. To be frankly computer is the safe place where we can keep data without been damaged or stolen. Each teacher can lock her works using password that no one can be able to open.

Through focus group discussion with pupils, pupil 1 from school C said that: -

I thank the donors and the government for the ICT equipment. We used to contribute money for examination and if your parents do not have money you may miss the examinations especially the monthly exams. Now we are not paying money for examination because we get the examination from our school. No more money contribution and each pupil can get examination happily.

However, the researcher reviewed school documents and observed that, primary teachers are using school computers to prepare lesson plan, scheme of work, school reports within a short time. The researcher revealed that using ICT in primary schools is the best and quick way that makes teachers to enjoy much in their professional. The reviewed documents were school terminal and annual examinations, monthly tests, school reports, scheme of work and lesson plan which were in soft and hard copies.

4.2.5 ICT Used in Teaching and Learning other subjects

Due to the spread of science and technology, it is important for any growing child around the world to have computer knowledge. In primary schools, computer has been taught as the part of ICT subject. Pupils learn introduction to computer and how to use different programs in computer in simplifying learning process. For example, pupils of standard six and seven learn word processor, excel and power

point. Teaching and learning these programmes goes together with K-touch a programme used in teaching and learning how to type in computer. Not only that but also primary teachers use projector to display teaching and learning materials when they are teaching other subjects. Since there is insufficient of computer sets, teachers use projector to teach computer as subject, science, mathematics, history geography, English and Kiswahili. This was revealed by the research as teacher E2 who is the ICT expert from school B said: -

Projector and computers set used to teach pupils. Pupils go in computer lab where they learn different computer programmes which help them to learn other subjects. These programmes are arranged according to the class level of the pupils and each group go to computer lab to learn practically as shown on the school timetable.

The findings from focus group discussion with pupils indicated that pupils are much interest to learn other subjects through ICT. This was revealed by the researcher when pupil 4 from school B said that: -

Before having computers, we used to learn all subjects in theory but nowadays we are learning computer practically and other subjects because we can see videos and picture through ICT equipment. This attract us much to learn since practical is better than theory and it help us to understand well than before. For example, I know how to switch on computer, how to use programmes like K-touch, word processor especially when I want to write a letter. Moreover, I use Microsoft excel in calculating and arranging my timetable. Also, in English subject I learn how to send and receive emails from my friends.

Another pupil 3 from school A responds that:

I enjoy much when I play computer games like tax maths, fish, penguin, and tax typing. These games give me more experience in typing and calculating. Additionally, I increase my vocabulary because the more I play the more I get new vocabularies.

4.2.6 ICT Improves Teaching and Learning

Present of ICT equipment in primary schools helps to advance teaching and learning in a sense that ICT makes pupils to build self confidence in learning. In order to have successive nation, the necessary skills like ICT skills should be included in the primary schools' education. Using ICT in teaching and learning includes using pictures and videos with vivid examples that create confidence to the teachers and

learners. So, teachers' technological knowledge gives chance to the learners to get more knowledge about what they are learning as well as integrating computer technology in learning other subjects. For example, a teacher can use mathematics programs which are videos in teaching mathematics.

Nevertheless, using ICT in teaching and learning creates conducive environment that motivate learners to understand and to be competent in a certain subject. For example, thinking capacity of a pupil who plays subject games is completely different to a pupil who never plays games. If they are in the same class the difference can be revealed because when teachers ask question during teaching and learning, those who play games are faster in answering than those who never play subjects games. This was discovered by the researcher as interviewed H3 who is the head teacher from school C who said that: -

Yes, ICT improves teaching and learning in my school, teachers use ICT equipment like laptops and desktop computers in teaching and learning other subjects like science, mathematics, English, geography and history. Example in science subject I can get pictures concerning with the subtopic that I am going to teach and share it with pupils in their computers through local network we have in our computer lab. Also, other teaching and learning materials like maps, historical events, sending and receiving emails and games like tax maths, dice and fish that make the brain of a pupils to be active while they are learning.

4.3 Factors influencing usage of ICT to make effective teaching and learning in Morogoro Municipality Public Primary schools

This objective aimed to find out the factors that motivate teachers and pupils to use ICT in teaching and learning in primary schools. The theme contains sub themes which are the government policy on ICT usage in primary education, pupil's attention during teaching and learning, Practical and Activeness in teaching and learning and ICT Saves Time and Reduce Cost in Teaching and Learning. In this objective qualitative data were collected and the found factors that influence the usage of ICT in primary schools as shown below: -

4.3.1 The Government Policy on ICT

The government ICT policy which allows ICT to be used in classrooms while teaching and learning process has been motivate teachers to learn and use ICT in teaching and learning. Before the introduction of ICT policy, accessibility of school records, practical and it was difficult for teachers to use ICT because when quality assurers arrive, they ask teachers show both hard copy and softcopy of teaching and learning materials like lesson plan, scheme of work and Pupils progressive assessment report. This discouraged much primary teacher to use ICT because they were wasting their time to prepare both soft copy and hard copy. This reduces the speed of teachers in learning ICT because it was not appreciated by the education leaders as they come for assessment. Soon after the government implements the ICT policy, teachers are free to use ICT in teaching and learning without being challenged by the educational leaders and quality assurers. Through interview with teacher M1 from school A, the researcher revealed as the teacher said that: -

What makes me to use ICT in teaching and learning is the government Policy on ICT that allows primary teachers to be free in using ICT in teaching and learning in classrooms. I use ICT to prepare my lesson plan, scheme of work, pupils assessment records and lesson notes. But I enjoy much when I project the lesson in the classroom as I never talk much because the videos contain sounds. Sure, I am telling you this is the best way of teaching our pupils. I really appreciate the government's plan of using ICT in teaching and learning at this primary level of education.

Furthermore, teacher E3 who is an ICT expert in school C added: -

The usage of ICT in this school is mostly motivated by the permission from the educational officers and the government. Before the educational officer and the educational quality assurance were confused themselves as well as confusing teachers on the usage of ICT in teaching and learning. Since the government allow the usage of ICT there is no more confusion.

4.3.2 Pupils' Attention While Teaching and Learning

ICT makes pupils to have attention while they are learning because they are much attracted by the ICT equipment that make them to understand well. For example, teachers use sound and video equipment like speakers, that contain a lot of examples which a pupil can listen and understand well. Additionally, ICT help teachers to save time and energy while teaching. Since there are videos and sounds that contain really

examples, teachers do not have to use much time in giving explanation of what is being taught. Teachers use projector to show videos and speakers that the sound could be heard by the whole class and this makes pupils to be attentive in order to watch and hear what is projected. Not only that but also ICT reduces sound which was made by pupils while teachers were teaching before having ICT equipment. Now, it is difficult for a pupil to gossip while learning because everyone wants to learn through this new technology of teaching. Through the conducted interviews, E1 the ICT expert from school A said that: -

The main advantage of using ICT equipment is that, pupils are attracted to be taught using ICT instrument and this makes them to have attention that they can watch and listen carefully. My pupils never make noises while I am teaching like before I started using ICT. Truly, this makes me to use ICT much in teaching rather than normal teaching.

H3 who is the headmaster from school C commented on this by saying that:

As the pupil is attracted, he/she understands well the lesson rather than those who do not use ICT. ICT reduces teachers' words while teaching. You know ICT contains a lot of videos, sound and pictures with really examples that can be used in teaching and learning. When I use ICT to teach in classrooms, I do not burn much calories like before having ICT instruments.

4.3.3 Accessibility of School Records

The schools' documents stored in the computers can be reached simply as soon as they are needed because it is simple to switch on computer and get the documents like pupils' records, scheme of work, pupils' continuous assessment, lesson plan, lesson notes and other records. Before having these computers, it was very difficult to get these records because some were already damaged because they are stored in poor environment where there is full of dust. Furthermore, some of the documents were lost and others were spoiled by rats and insects. As these documents are stored in the school computers, it is easy for a teacher to get reference when she / he wants to prepare a new lesson plan. Similarly, if a teacher is transferred to another school, the documents can help to know where the transferred teacher ended, and the subject can be given to other teachers easily. Through an interview with teacher M2 from school B the researcher revealed this is true as the teacher said that: -

For me I am much interested to use ICT in teaching and learning because I can get my documents from the computer easily. In the past years I used to write a lot of documents which later became useless, but now I can get all documents for the whole year. For example, all my lessons plan, and scheme of work are still there in the computer. I can get them easily and use them as reference to prepare new one. I have all past examination records here in the laptops.

Also, the head teacher H1 from school A commented on this through interview by saying that:

School documents can be reached quicker and easily. As the head teacher if I need the three past years' documents, I can get them here from the computer effortless. This is different compared to the past that we had to go to the store and find the documents manually while the place is very dust and sometimes, we became tired because the documents are so many. For sure this makes me to be interested in using ICT in teaching and learning.

4.3.4 ICT Saves Time and Reduce Cost in Teaching and Learning

Primary teachers save time as they are using ICT in teaching and learning using projector. Also, preparing lesson in the laptops or the desktop computers, teachers do never use much time because they fill the gaps in the lesson plan that is already prepared. It is very simple to prepare on the computer rather than before that, they must write the lesson plan themselves from the beginning to the end. This was revealed when the researcher interviewed M3 from school C as the teacher said that:

When I use ICT first, I save my time because writing on the chalkboard I will have to clean it when the chalkboard is full but using ITC, I just prepare my slides and presents on the whiteboard. I do not waste my time cleaning the chalkboard.

Apart from time saving, ICT reduces teaching and learning costs as teachers used money to make photocopies for the scheme of work, lesson plan and other office documents. The most cost was to prepare pupils terminal and annual examinations something that they can do it at school since they are already have ICT equipment. Through interview with the head teacher H2 from school B the researcher revealed this as the head teacher reported:

Using ICT saves cost, I am saying that because I used to go to stationary to type the examination and making copies. This was a simple way but very cost because sometimes if the school does not have cash, I use my pocket to pay for school exams. I have been asking the parents to contribute but some are

very poor, and the government policy of free education protect them that they never contribute even if they have. Since our school having this ICT equipment, I have never used my pocket for stationary. I type and print the examination myself and I can make copies as many as I want.

4.3.5 Practical and Activeness in Learning

Using computers in teaching and learning makes pupils to be active in learning as they can ask and answer questions quickly. Pupils learn practically in computer labs while they are studying different subjects such as geography, English, science, mathematics. While the researcher was studying this the pupils through focus group discussion responded as follows. Pupil 4 from school C reported that: -

Learning by using ICT equipment makes us to be active and sharp in answering questions. Even when we have examination competition, we win because of our activeness of answering questions that we get from computer games.

Another comment was revealed from pupil 1 of school A who reported about learning practically through ICT equipment.

I enjoy using ICT because I learn practically, for example, I did not have an idea about rocks and Volcano Mountain but later I understand through watching videos and picture. Also, one day our history teacher was teaching historical sites and we understood by watching videos.

4.4 Challenges of using ICT in teaching and learning in Morogoro Municipality Public Primary schools.

Primary teachers are ICT in teaching and learning as the easiest way with advantages in providing quality education in Primary schools of Tanzania. This objective aimed to search challenges that Primary teachers of Morogoro Municipality faced while using ICT in teaching and learning. ICT has played a big role in developing primary education but still overloaded materials, electricity cut off, shortage of ICT equipment, ICT equipment theft and low knowledge on ICT are challenging the ICT usage in primary schools.

4.4.1 Burdened Materials

If the teacher is not careful, there is a possibility of getting materials which are not equal to the level of the pupils. As primary teachers are using internet in getting meaning of some topics especial those who find the meaning of vocabulary, they

may go beyond the pupils' level if they are not careful with the meaning they are finding from the internet. Teachers need to study and understand well the meaning and the given examples before they feed it to the pupils. For example, all the given definitions are belonging to a certain level of education; the meaning of noun for primary school pupils is not equal to the meaning given for the secondary school students. So, it is important for a teacher to be careful with what is from the internet. As arguing this M2 who is a teacher from school B said that: -

I use internet to get meaning and definition, when I write the topic on google, I get a lot of meaning given by different people and of different level. But I never just pick one and use it in teaching, no, I read all the meaning and then I select the simple one which will be easy to be understand by the pupils and then I use it in teaching. Also, I do the same when I download videos and picture for teaching otherwise the pupils will be confused due to the level of understanding.

Furthermore, the researcher discussed with the pupils through FGD and discovered that even the pupils can go out of the topic while the teacher is teaching if the teacher is not careful with the class. Pupil 2 from school A reported that: -

Sometime pupils can do other things while the teacher is teaching. Some can play games because they like game competition like one day, a pupil was playing game, but I raised my hand and I told the teacher then the teacher locked the game.

4.4.2 Poor Electricity

Electricity is a main challenge in the use of ICT in teaching and learning. It happens especially when teacher and pupils are in the computer lab learning using the desktop computers, sometimes as teachers are teaching the electricity go off. This situation faces teachers and pupils while teaching and learning. To stop the class and continue manually disturb the pupils' attention. This makes difficult to continue with the class as in the beginning because it is difficult to pull back the pupils' attention especially if the lesson was at the highpoint. Some of the schools have solar power but still it is a problem because it is there for the internet modem only. The solar power cannot be used to switch on all computers in the computer labs because it has small capacity of power. Moreover, the electricity challenge does not end there; sometimes the school have few units of electricity and return the cost of buying to the teachers especially when they need to download materials and the school administration does not have

cash for electricity. When teachers were asked about the challenges through interview with the researcher and they replied as follows: teacher M2 from school B said that:

The challenge that grows very fast in the use of ICT in teaching and learning is electricity. This sometimes confused me because it happens many times the power went off while I am teaching in the computer lab. Pupils started to make noises and it was difficult to help them to pay attention. Somewhere already loose the interest of learning, somewhere not ready to listen from teacher without using computers. So, it brings misunderstanding and last we end up by closing the class waiting for electricity to come back.

Another respondent M1 who is an ICT expert from school A responds that,

Sometimes you may find we do not have electricity and the school has no fund for buying electricity. I use my own money to buy credit for my smartphone that I can download what I want to teach. Not only the credit for the smartphones, but also, I buy electricity especially when I want to use projector in teaching in the class. This happens when the school does not have money. But the electricity costs are not equal to the examination typing and photocopying costs. Buying electricity is cheaper than going to stationary for typing and photocopying.

Through focus group discussion pupils were asked the ICT challenge in teaching and learning, and their responses were as follows: -

Pupil 1 from school B said that: -

The problem is when the power gone off, I loose learning motivation because I do like to go back and learn in the normal class. I like learning in the computer laboratory but when there is no electricity power, I loose learning morally even I cannot listen from the teacher anymore.

Another pupil 2 from school C said that: -

When there is no electricity power, the school administration must ask our parents to contribute some money for buying electricity because the government does not provide enough money for school management and electricity. This is a challenge because some of us are coming from poor families, so it is difficult for us to contribute for the payments. The situation leads us to miss some computer lessons or sometimes our teachers failed to use projectors and that make us to lose learning motivation.

4.4.3 Shortage of ICT Equipment

It is true that ICT is there to simplify teaching and learning process. Including this technology in teaching and learning helps to provide quality education in Tanzania. The number of the provided ICT equipment is the challenge to the school administrators and the pupils. Most of the schools have more than five hundred pupils but they have only one projector and four to ten laptops. This is a problem because, when one teacher is using projector in a certain class, the other one must teach without projector because a single projector cannot project in two different classes. Also, the desktop computers are between twenty-five and thirty-five, so it is difficult for a single pupil to use single computer because one class contain more that seventy pupils. As the researcher interviewed the teachers, teacher H2 who is the head teacher from school B said that:

In our school we have few computers and many pupils make teaching and learning to be uncomfortable because sometimes one computer is used by four pupils at the same time. One of the pupils hold the mouse, another one keyboard and the two will keep watching what others are doing that they can practice may be during the break time.

Teacher E3 who is an expert from school C added that:

The school have few laptops and single projector. This is the challenge when the teachers want to prepare lessons, also when they wat to project it become difficult for a single projector to be used in two classes. Also, when teachers are preparing examination reports, the same challenge attacks the teacher.

On top of that, the computers supplied by CAMARA and other donors are very few compared to the number of pupils. Most of the classes in public primary schools contain a big number of pupils; for example, one class has eight to one hundred pupils while the donors have provided twenty to thirty computers. As the researcher studying this through FGD with pupils, they respond as follows.

Pupil 3 from school C said that: -

Like us in the class we are eighty-two when we enter in the computer lab, we must sit two or three using one computer. We do not have enough chairs, tables and the computer set. It is difficult for us to learn comfortable because this single chair is for a single person, but we force it to become a chair for two people. I think in the future all chairs will be broken because they are not

used properly. So, we are going to miss chairs as well as learning through ICT.

4.4.4 ICT Equipment Theft

Although the government is putting the efforts in modifying education by providing ICT equipment, still the schools are challenged by the theft of ICT equipment. Some of public primary schools are complaining of being attacked by this problem for some days. ICT equipment like desktop computers, mouse, keyboards and monitors were stolen because the public primary schools do not have stable security, so it is simple for thieves to enter in the schools and take away the school computers and other school materials. While exploring this information, the respondents contribute as follows;

During the interview with the respondents, teacher H1 who is the school head teacher from school A reported that: -

My school has been broken three times by the thieves. Two times they took the three flat monitors but for the third time they open ten system box and took all the hard drives from the system unit. Because of this, ten computers are not working unless we get the new hard drives. The other day they stole the monitor that was used by for the saver. It is a big challenge for us because the theft includes destruction of school environments like breaking windows, door, even the roofs.

Through focus groups discussion with the pupils, pupil 3 from school C: -

The big challenge in our school is thieves. One of the computers was stolen and our head teacher tried to find out the thieves, but we fail to bring back the computer. The head teacher reported to the police, but I do not know if the police are still in investigation.

Another pupil 3 from school A said: -

Theft of computer is a challenge in our school because, first the given computer sets are few compared to the number of pupils, so the thieves are taking us back to the analogy while we are already in digital. This affects us too much because the number of computers is becoming small and now, we cannot learn comfortable because ten computers among twenty-five are not working.

4.4.5 Low Knowledge of ICT

Knowing how to use ICT equipment is not enough to the ICT experts and teacher in public primary schools. Teachers need full knowledge on how to deal with computer maintenance that they can troubleshoot the problems while they are teaching and learning. Most of the teachers and ICT experts are smart in using soft wares like word processor, excel, power point and internet. They do not have knowledge on how to deal with maintenance even troubleshooting. The few ICT experts who were given computer maintenance knowledge through the government support they do not have ICT tools kit for practice, so they fail even to teach other teachers. When the researcher was exploring this information, the respondents reported as follows:

Teacher E2 who is the ICT expert from school B said that:

As an ICT expert in my school, the big challenge to me is computer maintenance. I do not have ICT tools kit that I can use to open the computers and solve some problems. Because of this it is difficult even to clean computers especially those need to be open by the special tools.

Another M3 who is a teacher from school C responded that: -

My big challenge is when computer faced any kind of problem it is difficult to solve because the knowledge that I have is on how to use computers especially in excel, word processor, presentation and surfing on the internet. But how to solve problems like stacking, fail to respond to a certain command or screen fail to turn on are problems that I cannot solve unless I call for help from other schools' experts.

Concluding Remarks

The collected information as presented above by the researcher, the findings has revealed that, the ICT usage in Public Primary schools of Morogoro Municipality is very important because is the party of developing education in Tanzania. The twenty first century pupil must be able to integrate computer technology in the process of teaching and learning. The role of ICT in teaching and learning in public primary schools is to help pupils to get quality education that will be useful all over the world. Using ICT in primary education helps to simplify teaching and learning as it saves time and education cost. Primary school teachers are much enjoying ICT in

teaching and learning as they are motivated by the Tanzanian government policy on ICT that allows ICT to be part of teaching and learning in primary schools.

Teacher and pupils appreciate the government's efforts of implementing ICT in primary education but still lack of ICT equipment, poor government support, poor knowledge, poor electricity, and lack stable security is still a problem in the ICT usage in primary education.

CHAPTER FIVE

DISCUSSION OF THE FINDINGS

5.1 Overview

The purpose of this study was to assess the usage of ICT in teaching and learning in primary schools. The study was conducted in three selected primary schools which are in Morogoro Municipality. This chapter shows a discussion and interpretation of the findings presented in chapter four connecting with the reviewed theoretical and empirical literature. The study was guided by three objectives which are to identify the roles of ICT in teaching and learning process in public primary schools in Morogoro municipality, to find out factors influencing usage of ICT to make effective teaching and learning in Morogoro Municipality Public Primary schools and to search challenges of using ICT in teaching and learning in Morogoro Municipality.

5.2 The roles of ICT in teaching and learning process in public primary schools.

This theme aimed to describe the roles of ICT in teaching and learning in public primary schools partially the selected primary schools of Morogoro municipality. As the first specific objective, the study employed interview focus group discussion and document review as data collection instruments. Through interview and FGD, participants mentioned the roles of ICT in teaching and learning which were as follows. ICT used to send and receive school information, to get appropriate teaching and learning materials, teaching in overcrowded classes, to simplify teaching and learning process and teaching and learning other subjects. Consequently, the sub themes that were found are presented and analysis as follows:

5.2.1 Sending and Receiving School Information

Using ICT in primary schools help to build the capacity of teachers, administrators and other education leaders to use and integrate ICT in education system (Batanero, Sanudo, Rueda and Martinez 2019). The findings of this study show that, some of the primary school teachers are much interested on using ICT to send and receive school information although this is mostly done by the head teachers ICT experts and

academicians. Other teachers are interested but they never send information because they have negative perception that, sending and receiving school information is head teachers and academicians' responsibilities.

Furthermore, searching more information the researcher revealed the use of tablet to send and receive school information is done by few teachers who have enough knowledge but others are completely empty and they are not interested to learn because they believe sending and receiving school information is the school administrative responsibilities. The related study done by UNESCO (2015) revealed that, ICT experts and the school heads were much responsible with the usage of ICT for the school administration issues. Other subjects' teachers fail to use ICT because of their negative perception on the ICT usage in Primary schools.

5.2.2 ICT Provides Favourable Teaching and Learning Environment

ICT allow primary school teachers and pupils to access teaching and learning materials through internet and other software materials installed in computers. The researcher of this study observed that, quality teaching and learning environment attracts pupils to learn by using ICT. For example, all textbooks and supplementary books are available in the school savers where teacher and pupils can open through their computers. Likewise, a study by Zhang (2013) who observed that integration of ICT in primary education attracts teachers and learners to have a positive attitude because of the conducive learning environment.

Another related study was done by Cavas et al. (2009), revealed that the use of new technologies in the school administration issues is essential for providing opportunities for teachers to learn and to operate in an information age. ICT creates favourable environment for school administrators as they can prepare the school reports easily and they also save time. The school administrations that integrate the use of new technologies prepare their teachers and the head of schools for life in the twenty first century. Thus, ICT can effectively improve teaching and learning environment and abilities hence increase teachers' ability to perform school's works.

5.2.3 ICT is a Source of Conducive Teaching and Learning Materials

ICT in primary education is used as a source of teaching and learning materials. The researcher revealed that, primary school teachers can acquire the skills of integrating digital education materials, digital books and teaching and learning methods. Through interview with primary teachers the study discovered that, it is easy for teacher and pupils to get teaching and learning materials since the materials such as textbooks are available on the school server. A similar study done by Ghavifekr, and Rosdy, (2015), revealed; integrating ICT in primary education help teachers to get Updated materials. Likewise, a study conducted by Morrissa (2011) revealed that the challenges of getting teaching and learning materials on the world today is because of teachers' weaknesses of using technology. The study insisted that primary school teachers should be serious in integrating technology to assure quality education.

Moreover, Materials such as handouts, pictures, graphs and other writings are made available to teachers and pupils and they can download. The same study done by Omwenga, Waema, and Eisendrath, (2002) states that, with ICT devices, teachers and learners can use internet to search for materials online. For example, textbooks, journals, articles and videos which are necessary for teaching and learning in primary schools. Materials are also exchanged and communicated from one person to another or one institution with others through emails, live chats and conferencing.

5.2.4 Using Projector in Overcrowded Classes

The findings discovered that, primary teachers used projectors in teaching and learning especially in overcrowded classes and this is viewed as a solution in teaching classes with a big number of pupils. Using projectors make the pupils to concentrate in what the teacher is teaching so primary teachers are mostly interested on using projectors because it is a new teaching and learning method that is simple to apply as well as drawing pupils' attention although the projectors are few in schools. Using projector in teaching and learning especially in overcrowded classes has been observed by other researchers like Kihoza et al. (2016), Mwalongo (2011) and Mbwana (2009), whose findings suggested that, primary school teachers can use projectors to teach classes with a big number of pupils. This will help the teachers to develop new knowledge skills in teaching and learning since they are using new

teaching and learning methods that based on the current technological education. Additionally, another study by Sedoyeka and Gafufen (2013) revealed that, primary schools which were using projectors in teaching classes with big number of pupils were performing well in their examinations rather than those with no projectors.

5.2.5 ICT Simplifies Teaching and Learning

This is another sub theme presented by the primary school teachers. The findings have revealed that, primary school teachers are much using ICT as a simple way of preparing lesson plan, scheme of work, lesson notes and pupils' examination reports. While the teachers were interviewed, they clarify that, this was the most cost they had in their school and they lost time in stationary making some copies for the lesson plan and scheme of work. Su (2011) recommended that using ICT in teaching and learning creates favourable environment that motivate pupils to understand and to be competent in a certain subject.

Nevertheless, the existence of ICT in primary education transforms primary school teachers from analogy to digital lesson preparation and teaching and learning pedagogy. The researcher revealed that teachers can prepare teaching and learning materials and share theme with other schools to get more ideas. According to Nihuka and Peter, (2014) ICT usage in primary school is very important because teachers nee pedagogical knowledge that can help them to meet the21st millennium goals for primary education. ICT lesson plans are prepared in a simple way than writing it manually; using ICT to prepare lesson plan, and lesson notes also saves time. ICT integration in primary education not only simplifies teaching and learning process but also saves time. The study is related to the current research because the study shows the role of ICT in primary education which is equally to the one revealed by the researcher.

5.2.6 ICT Used in Teaching and Learning other subjects

Another sub them found by the researcher of this study during the interview and focus group discussion with pupils and primary school teachers is the integration of ICT in teaching and learning other subjects. The researcher of this study revealed that, including ICT in teaching other subjects helps in the pupils to understand,

remember and can apply the skills in life. Through interview the respondents claim that, ICT is used to teach other subjects for example, instead of preparing lesson notes manually and write them on the chalkboard, the subject teacher can prepare in the computer and project theme during the class.

Similarly, a study by Sanee (2012) reported a significant difference score of two groups, the control group had improved skills of understanding, remembering and application while the other group had no differences. Moreover, primary teachers use internet to get teaching and learning aids which are videos and pictures. Also, Pale (2005), revealed that ICT comprises of resources and systems that make learning and teaching faster, easier, better, focused, broader and deeper thus enhancing the understanding and mastering domain knowledge and skills. Other similar studies are Shepr (2003) who investigated the effects of using ICT in teaching science. The integration of ICT in primary education makes other subjects to be understandable easily and faster than before having ICT in primary school education.

5.3 Factors Influencing Usage of ICT to Make Effective Teaching and Learning in Morogoro Municipality Public Primary Schools

This is the second theme in this study that aimed to get information about the factors that influence primary school teachers and pupils to use ICT to make effective teaching and learning. The researcher used interview and focus group discussion to explore information about this theme. Also, through documents review the researcher got more information about the factors that influence primary school teacher and pupils to use ICT in teaching and learning. The finding revealed sub themes like The Government Policy on ICT, Pupils' Attention While Teaching and Learning, Accessibility of School Records, ICT Saves Time and Reduce Cost in Teaching and Learning and Practical and Activeness in Learning. These sub themes are discussed below.

5.3.1 The Government Policy on ICT

Since the MoEVT developed the ICT policy to guide the integration of ICT in primary education, teachers are free to use ICT in teaching and learning. This was revealed by the researcher through interview with head teachers, ICT experts and subjects' teachers who show their interest of using ICT because the government have allowed them to assimilate ICT in teaching and learning in primary schools. The participants of this study gave more elaboration that, the government policy set the teachers free from the educational officers' confusion. Many time primary teachers where confused by the educational quality assurers because teachers had to prepare lesson plan and scheme of work in softcopy and hardcopy. The study is also insisted by Nico, Ruttena and Wouter (2012) who revealed that in order to have successive teaching and learning, ICT skills should be integrated in education system from the pre-primary schools to the higher level of education.

Another related study done by URT (2007) state that, the ministry recognized the gape existing between education levels in institutions, and the potential benefits of ICT in Tanzanian education system. Therefore, the ministry implemented ICT in primary education from kindergarten to standard seven in order to cover the technology gape in primary education as it is stated in the 21st century educational millennium goals. The national ICT policy of 2016 insisted the usage of ICT in daily life since the country is changing to industrial economy. The intention of the policy focuses to promote usage of ICT in different sectors especially in Education since ICT has the possibility to improve active delivery of formal and informal education URT (2016).

5.3.2 Pupils' Attention During Classes

This is seen to be among the factors that influence the primary school teachers and pupils to keep using ICT in teaching and learning. The theme was revealed by the researcher while interviewing the primary school teachers and the ICT experts who proved that using ICT helps the learners to pay attention because videos and pictures creates conducive learning environment to the pupils. Through FGD, the pupils showed that ICT provides new teaching and learning methods that make them to pay

attention in learning and to be creative in technology. Ghavifekr, and Rosdy, (2015) cited Wu and Hsu (2014) in their study which revealed that, pupils are having higher expectation in the use of ICT in learning because, today's generations are born and growing in the world of technology. This Pupils attention also was revealed by Condie, Munro, Seagraves and Kenesson (2007), as they observed that, technologies with a visual dimension, digital video, photograph and video conference engage pupils and provide a stimulus for collaborative working and discussion because pupils are in control of technology. ICT give pupils a sense of ownership and control of the learning process that is not essay for a pupil to go out the subject matter while learning (Nakiyima 2011).

5.3.3 Accessibility of School Records

ICT in primary schools is been used to keep school records and it is easy to find theme when they are needed. This is the potential impact of implementing ICT in primary schools as revealed by the researcher through interview with the head teachers, ICT experts and subject teachers. The primary school teachers are interested in using ICT because they realized that it is easy to access the school records immediately. This information was revealed by the researcher when interviewed H1 who is the head teacher from school A. during the interview the head teacher said that:

“School documents can be reached quicker and easily. As the head teacher if I need the three past years’ documents, I can get them here from the computer effortless. For sure this makes me to be interested in using ICT in teaching and learning.”

The study done by Essays, (2018), insisted that; ICT as the technological advancement contributes the effective storage and management of school records. According to Mutisya (2017), ICT integration in school management helps the school managers to have the information of pupils and teachers easily as soon as the information is needed. ICT has played an important role in improving data keeping in school managements, and it has made the school information to be widely available to school personnel, parents and the public at large through the school management web and other internet accessibilities. Other related study revealed that, ICT helps to keep school records, and this is the easiest way for teachers and school

administrator to access the records. Many schools today own website where they put documents that can be reached by parents, education leaders, teacher and pupils (Olontegbe, 2014).

5.3.4 ICT Saves Time and Reduce Cost in Teaching and Creates Confidence

Using ICT in public primary schools saves time and cost something that makes teachers to be interested in using ICT much. Saving time, money and making easier for pupils, staffs and parents in providing quality education and creates confidence to the learners and teachers (Alharbi 2014). The study reveals, that teachers and pupils are much interested in using ICT in primary education because ICT saves time and education costs. For example, the school managements used a lot of money to conduct school examinations and availability of other school information which were printed in the private stationaries.

This is related to the study conducted by URT (2005) that revealed that whether the school use desktop or laptop computers in conducting the school activities, it is easily and costless because the work is done on home office that can help in time saving and cost. If the subject's teachers type and print the work themselves, they save the cost rather than taking the work to the stationary. Moreover, using internet in primary schools helps to get non cost teaching and learning materials such as textbooks, supplementary books, handouts, videos and pictures within a short time.

5.3.5 Practical and Interaction in Learning

This theme was much discussed by the pupils who seemed to be much interest in using ICT in teaching and learning. Through focus group discussion with the pupils, the researcher revealed that pupils likes to use ICT because it allows them to monitor and manage their own learning, think critically and creatively, solve simulated real world problems, work collaborative and involved in ethical decision making and adopting a global perspective towards issues and ideas. ICT classroom interaction is also insisted in the study done by Beauchamp (2011). Also, Mujis and Reynolds (2010) suggested that ICT provides interaction among the learners that helps teachers to understand the learning capacity of a pupil since ICT give the pupils chance to have sharp brain and to be experts in the learning processes. The study done by

Vankatesh Morris, and Ackerman (2010), discovered that, using ICT in primary schools help the pupils to learn practical without cost. For example, instead of moving from one country to another for a certain project, the school can prepare videos and pictures that could help pupils to understand well something better than travelling with few pupils who will learn practical and others remain with theory.

5.4 Challenges of using ICT in teaching and learning in Morogoro Municipality Public Primary schools

The main idea in implementing ICT in primary education is to make sure that every child is getting equal and quality education that goes together with the millennium goals of providing quality education which include technology. Although the government integrate ICT in primary schools to assure effective teaching and learning, still there are problems that hinder the ICT implementation. As the researcher where finding information about the challenges the head teachers, ICT experts, subjects' teachers and the pupils mentioned obstacles that affect them in using ICT in teaching and learning. Through interview and FDG the researcher revealed overloaded materials, electricity cut off, shortage of ICT equipment, ICT equipment theft and low knowledge on ICT are challenging the ICT usage in primary schools.

5.4.1 Burdened Materials

Although primary school teachers are much enjoy using ICT in teaching and learning, still there are facing by challenge of overloaded materials. This subtheme was revealed by the researcher while conducting interview with teachers to find out the challenges of using ICT in primary education. One of the key informers who was an ICT expert from school B said that, "*overloaded materials is the challenge while using internet in teaching and learning because google contain a lot of materials for different level of education.*" A study by Gihavifekr and Rosdy (2015) revealed that, teachers fail to use internet accurately because they are not given enough education at the right time. The ICT knowledge is provided in very short time. Before using materials from the internet, the teachers must read careful in order to sort out the important materials for the primary school learners. This study in related to the study

done by Salehi (2012), who explored the challenges for using ICT in primary education, and the finding stated that the process of using ICT in primary education is very complicated because the opportunity provided by ICT in teaching and learning are not problem free. The accessed information in an educational context can pose a real danger of information overload if the teachers do not have skills in filtering information to get relevance materials. This study is differing to the study of Morrissa (2011) who said that ICT challenges like overloaded materials from the internet is because of teachers' weaknesses of using technology.

5.4.2 Deprived Electricity

Swart and Wachira (2010), in their study revealed electricity as a problem in the usage of ICT in primary education. The telecommunication network and internet are limited in some cities and this goes together with the electricity limitations that make difficulties to use ICT in primary education. Sometimes teachers are missing electricity because of infrastructure or the cost of buying electricity in primary schools.

The researcher observed this when conducting interview with the head teachers, ICT experts and other teachers who exposed that, electricity cut off is the problem that can occur during the classes and affects the learning process. Through focus group discussion, the pupils also show their feelings on the electricity cut off while they are learning. A study conducted by Ogbomo (2011) revealed that the national electricity grid is still limited to commercially viable areas are missing out most of the schools especially those in the rural areas. The urban areas are limited with the electricity breakdowns and cracking that increased the cost of owning ICT infrastructure. The interruption of electricity cut off can lead the pupils to drop learning morally and make the teachers to keep repeating the topic several times. UNESCO (2013) insisted that, the integration of ICT in primary education requires electricity which is regularly and readily available.

5.4.3 Scarcity of ICT Equipment

The study observed that the provided ICT equipment are very few compared to the school needs. Through the interview with the primary schools and the pupils the

researcher observed that, all studied schools have one projector, four to ten laptops, one printer and twenty to thirty-five desktop computers. By using the checklist also, the researcher observed that one of the three schools do not have a photocopy machine, so they need to move to stationary to photocopy school documents especially the examinations. Having few ICT equipment lead to the poor usage of ICT because it is difficult to divide the equipment to the pupils during teaching and learning.

Scarcity of ICT equipment is also revealed by Salehi H. (2012), as the barriers for using ICT in classroom. In his study, he revealed that, teachers believed that shortage of ICT equipment is a main barrier for the teachers and pupils in integrating ICT in primary education.

Moreover, the researcher of this study through documents review like a handover contract between the school and the donors of the computer, the researcher revealed that the given computer sets are very few compared to the number of the pupils. Most schools have four to ten five laptops and twenty to thirty-five desktop computers. This is difficult for teachers to work properly and complete on time especially during the examination results preparation. Additionally, the pupils are divided into groups in order to attend the practical lesson in the computer lab. The obtained information is negative to OLPC (2013) which maintained that to ensure effective learning each pupil should own a laptop.

5.4.4 ICT Equipment Theft

In today's education, ICT is more than a passion to the teachers and pupils. A research by Netgear shows that; more than half of the primary teachers are using ICT in teaching and learning every lesson. The experience show ICT increases interaction among the teachers and pupils which end to the provision of quality education and if the donors in cooperation with the government did not provide computers in primary education the schools could be left without technology (Salehi H 2012)

Unfortunately, these high level and expensive equipment for education development have been the attraction of thieves who destruct the school many times. During the interview with the school heads, the researcher revealed that two schools among the

three have been attacked by thieves and many computers have been taken away. The same study done by Barnes and Kennelly, (2017) claim that the presents of ICT equipment have led to the destruction of school buildings.

5.4.5 Low ICT Knowledge

During the study, the researcher experienced that most of the primary school teachers are not competent in using ICT. The head teachers have the little knowledge on using the tablets for sending and receiving school information and the subject teachers can search on internet, connecting computer to the projector for projecting, and slight knowledge of computer programmes like word processor, excel and power point. Other important programme like computer maintenance is completely unknown by the teachers and the head teachers. The ICT experts seems to have little knowledge on computer maintenance techniques such as to trouble shoot some computer problems but no one with the ICT working tools that can help for maintenance of the school computers. The related study done by Tezci (2010) who concluded that the ability of to integrate ICT in teaching and learning is low.

A study done by Young S. (2003) suggested that insufficient technique supports at schools and little access to internet prevent primary school teacher to use ICT in classrooms. Further, the study revealed that the usage of ICT in primary education became very complicated because teachers lack the technique support that will help them in problem solving.

5.4.5 Concluding Remarks

This chapter reviewed the findings presented in chapter four and offered a discussion according to the research objectives. The main aim was to explore information about the usage of ICT in primary education as discussed above. Sending and receiving school information, providing teaching and learning materials, projecting in overloaded classes and ICT integration in other subjects were revealed by the researcher as the roles of ICT in primary schools' education.

Moreover, the study went far and revealed that the government policy on ICT, pupils' attention during the classes and the access of school records easily have played a big role of influencing the primary school teacher and pupils to be much

interested in using ICT to learn. Class Activeness and practical learning, and minimal Cost in Teaching and Learning also gathering teachers and pupils in the computer lab teaching and learning other subjects through ICT.

Apart from the government's efforts of integrating ICT in primary education, there are some challenges that are the obstacles in using ICT to teach and learning in primary schools. Using internet to download materials can lead overloaded materials to the pupils and teachers if the downloaded materials are not well filtered. Poor electricity, Scarcity of ICT Equipment, ICT Equipment Theft and low knowledge on ICT are also the challenges that hinder ICT integration in primary education.

CHAPTER SIX

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

6.1 Overview

This chapter provides summary of the study, conclusion drawn in the study, theoretical and policy Implication of the findings, limitation of the study and suggestions for future research and last is the contribution knowledge of the study.

6.2 Summary of the Study

The purpose of this study was to assess the usage of information and communication technology in selected public primary schools of Morogoro Municipality in Tanzania. The study was guided by a conceptual frame-work obtained from the idea of different researchers in which the independent variables; electricity, ICT devices, ICT experts, government policy on ICT managerial support and technological pressure were used to measure the independent variable which is the usage of ICT in public primary schools. The study applied the qualitative research approach, which was guided by the explanatory case study design because of the nature of data collected, also the researcher wanted to get deep information about the usage of ICT in Public primary schools.

The population used in this study was twenty-one participants specifically three head teachers, three ICT experts, three teachers who teach other subjects apart from ICT subject and twelve pupils from the three selected primary schools. Purposive and simple random used to select the participants of the study. To collected information from the respondents, the researcher applied interview, focus group discussion and documentary review. The collected data was analysed manually and presented in chapter four through narration and tables.

From the first objective which was to discover the roles of ICT in teaching and learning in primary schools the results indicated that the roles of ICT in teaching and learning are Sending and receiving school information, providing teaching and learning materials, and ICT integration in other subjects. The second objective which aimed to find the factors that influence teachers and pupils to use ICT in teaching and

learning revealed ICT is the imperative in primary education since it provides the decent academic teaching and learning methods that can make teachers and pupils learn comfortable. The integration of ICT in teaching and learning provides more opportunity for teachers and pupils to work better in today's world of technology. Using ICT in primary education help the learners to think broadly and participate in learning with other pupils worldwide through the internet. For example, pupils can interact with other pupils around the world by sending and receiving information through email using the special program known as My Maarifa found on Jukwaa la i-knowledge.

The last objective which was to search challenges of using ICT in teaching and learning revealed the integration of the ICT in primary education is not well implemented since there are challenges that act as obstacles in ICT implementation. The ICT implementers are motivated by factors like technological pressure, government policy on ICT usage in primary schools, costless services and the present of internet around the school environment. Moreover, lack of serious management from the administration and educational leaders is the obstacle that commanded to the poor integration of ICT in primary education because the schools being attacked by thieves come since there is partial security in the school. The ICT equipment provided are not in good condition because they are few compared to the number of the pupils and the teachers and most are outdated so they need frequent maintenance otherwise they stuck while working.

6.3 Conclusion

The Government of Tanzania is moulding its education system to reach the world's millennium goals as recommended by the united nations, but the government is still not serious with the ICT integration in primary education because still the mentioned challenges are not difficult to be solved by the government. The main problem is that the government has left everything to the donors who dump the outdated ICT equipment from their countries without clear education on how to deal with the challenges of using ICT in primary education.

The primary school teachers are familiar with ICT usage in primary education however this does not mean that all primary school teachers can integrate ICT into the primary school curriculum. Insufficient knowledge on ICT, poor electricity, scarcity of ICT equipment and ICT equipment theft were reported as the key barriers for teachers and pupils to integrate ICT into primary education.

The study concluded that, there is no proper or serious integration of ICT in primary education done by the implementers because the findings revealed that, there is no follow up from the education leaders, some teachers are not aware with the ICT integration in primary education and when they try to learn the challenges push them back.

Hence, the economy of Tanzania is shifting to industrial economy that need much integration of science and technology in education system especially from primary schools levels the idea of integrating ICT in primary education is the best way of getting quality education that can help Tanzania to move with the technological speed around the world. So, the usage of ICT in primary schools of Morogoro Municipality can be effective if all the education participants will play their part excellently.

6.4 Implications of the Findings

6.4.1 Theoretical Implications

Theoretically the study suggests that the individual's characters such as gender, age, experience, capability and complexity are the best motivation for personal acceptance and adoption of technology in education. During the study the researcher revealed that most of the teachers who use ICT in teaching and learning were under forty years old. The group of the study participants who use much ICT range between the ages of ten to thirty-nine. This proves that people with young age are much interested in using ICT than the elders.

On the case of gender, the researcher revealed that females are the one-use ICT much than men. During the interview with the head teachers, ICT experts and the subject teachers, the number of the participants was as follows. School A has female head

teacher, female ICT expert and the male subject teacher, school B female head teacher, male ICT expert and male subject teacher and lastly school C male head teacher, female ICT expert and female subject teacher. The collected information proves that females are much interested to use ICT that why even the ICT experts from two schools are females.

Another theoretical character is capability in using ICT whereas teachers who have diploma and bachelor's degree in education are most interested with ICT integration in primary education because they have been practising ICT during their studies. This implies that, ICT integration in primary education also is the matter off experience. If the teachers will practice ICT in primary education effectively the implementation will succeed.

6.4.2 Policy Implications

For the policy implication this study indicates that, the government need to strengthen the ICT policy of the primary education so that it will push the education leaders to make follow up for the effective usage of the ICT in primary education for the development of the country. The existing ICT policy of 2016 provides that, proper utilisation of ICT will solve the society challenges and support the industrialization economy. Without integrating ICT in basic education, the country will face difficulties to meet the objectives of industrialization economy (URT 2016). So, the education policy for ICT integration in primary education lacks serious monitoring and evaluation of the programme implemented in primary schools that why the ICT usage in teaching and learning remained as teacher's option.

Furthermore, the study indicates that, it is important for the management of Morogoro Municipality to conduct ICT training or put emphasis on the training conducted by CAMARA Education each year between June and July. That will bring competence to the education stakeholders such as primary school teachers, the educational officers and the quality assurer who evaluate primary education.

The existing ICT policy also needs to be strengthened on the case of electricity used to operate the computers. The policy is weak because there is no actual income or fund directed to the primary schools for the electricity consumption. This makes teachers to use their pocket when they want to integrate ICT in teaching and learning.

There should be an ICT national examination while completing standard seven which will put emphasis to the pupils so that they will be serious while they are learning. This examination also should be conducted practically, and the best performance students could join VETA to develop their skills.

6.5 Limitations of the study and Suggestion for Future Research

The study was conducted to assess the effective usage of ICT in public primary schools of Morogoro Municipality specifically in three selected primary schools. It was a case study which employed a qualitative approach with a small size of population. For this reason, the possibility of generalising the findings is limited to the cases. During data collection the head teachers were attending the meeting for all head teachers of Morogoro Municipal primary schools but the researcher conducted the interview with the ICT experts, teachers and focus group discussion with the pupils. In the following week the researcher managed to re-conduct interview with the head teachers.

Also, during data collection the respondents were confused by the language used to identify the ICT equipment. For example, kishikwambi/tabuleti (tablet(s)), kiteuzi/mausi (mouse), kibodi/ kibaovifungo/ kicharazio (keyboard), kompyuta mpakato /kipaktishi (laptop), mdaki/skana (scanner), nywila (password). Teachers and pupils participated in the study were not aware with either Kiswahili name or English name so the researcher had to stop during the interview or FGD and explain the Questions to the respondents that they gave correct information.

Future studies can employ a survey case study with quantitative or mixed approach. Also, the study suggests that, another study should be conducted in the private primary schools of Morogoro municipality or in other districts which are Mvomero, Kilosa, Malinyi, Kilombero and Morogoro rural. In addition, the study deals only with the usage of ICT in public primary schools and it did not touch areas like the

importance of integrating ICT in primary education, impact of using ICT in primary education, pupils and teachers' perception on the ICT usage or the managements' perception about the Usage of ICT in primary education.

6.6 Contribution Knowledge

Despite its limitations, this study provides knowledge on ICT usage especially to primary school teachers and pupils, and contribution to the school management to ensure effect usage of ICT in primary education. The study offers strategies to improve ICT environment in primary education, therefore, gives knowledge to the educational leaders and the government on what they can do to ensure effective usage of ICT equipment. It also fills the gap of study and can be used as a literature for further studies on ICT and teaching in primary schools.

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APPENDICES

Appendix I: Interview Guide for Head Teachers

Name..... Sex

Education level

Work station

Years of Experience

1. Je, unafhamu nini kuhusu TEHAMA?
2. Je, kuna vifaa vya TEHAMA katika shule yako?
3. Taja vifaa vya tehama vilivyopo katika shule yako.
.....
.....
4. Vifaa vya TEHAMA hutumika kwa namna gani?
5. Ni nini kinakuchochea kutumia vifaa vya TEHAMA katika kufundisha na kufundisha.
6. Matumizi ya TEHAMA katika shule yako yanaridhisha? Je, kwa kiasi gani?
7. Je, ni changamoto zipi shule yako inapitia katika kutumia vifaa vya tehama kufundisha na kujifunzia?
8. Kuna walimu wa TEHAMA? Wanatosha?
9. Shule inasapoti vipi upatikanaji wa wataalamu wa TEHAMA na kuwapa mafunzo walimu?
10. Shule inafanya nini kuhakikisha upatikanaji wa vifaa vya TEHAMA?
11. Kama mwalimu mkuu unafanya jitihada gani kuhakikisha ufundishaji unakwenda sambamba na matumizi ya vifaa vya TEHAMA?
12. Uongozi wa Elimu inamsaada wowote katika kukuza matumizi ya vifaa vya TEHAMA katika shule yako? Eleza.

Appendix II: Interview guide for ICT experts.

Name.....sex.....

Education level.....

Work station.....

Years of Experience.....

1. TEHAMA ni nini?
2. Je, kuna huduma ya mtandao wa intaneti katika shule yako?
3. Kuna maabara ya kompyuta katika shule yako?
4. Ni yapi matumizi ya maabara ya kompyuta katika ufundishaji na ujifunzaji hapa shuleni? Yataje
5. Je, matumizi ya vifaa vya TEHAMA yanaboresha ufundishaji na ujifunzaji?
6. Je, kuna faida zozote za kutumia vifaa vya TEHAMA katika ufundishaji na ujifunzaji?
7. Je, unapitia changamoto zozote unapotumia vifaa vya TEHAMA kufundisha na kujifunzia? Zitaje
8. Je, kuna mafunzokazi yoyote yanayotolewa kwa ajili ya kuimarisha matumizi ya vifaa vya TEHAMA? Kana ndio, mara ngapi kwa mwaka?
9. Ni kwa namna gani unatatua changamoto za kitekinolojia wakati wa ufundishaji na ujifunzaji kwa kutumia vifaa vya TEHAMA?
10. Una msaada wowote kutoka uongozi wa Elimu kwa maendeleo ya vifaa vya TEHAMA? Kama upo taja.
11. Ni kwa namna gani umeweza kuwa mtaalamu wa TEHAMA katika shule hii? Eleza
12. Ni yapi hasa majukumu yako kama mtaalamu wa TEHAMA katika shule hii?

Appendix III: Interview Guide for Teachers

Name.....sex.....

Education level.....

Work station.....

Years of Experience.....

1. Neno TEHAMA lina maana gani?
2. Shuleni kwako kuna vifaa vya TEHAMA?
3. Je, maabara ya kompyuta ina umuhimu katika ufundishaji na ujifunzaji hapa shuleni?
4. Una ujuzi wowote kuhusiana na TEHAMA? Umeupataje?
5. Kuna wataalamu wa TEHAMA shuleni kwako? Elezea jinsi wanavyokusaidia katika ufundishaji?
6. Je, ni vifaa gani vya TEHAMA unatumia katika kufundisha na kujifunza?
7. Taja faida za TEHAMA katika ufundishaji
8. Ni nini kinachokupa motisha kutumia vifaa vya TEHAMA katika kujifunza na kufundisha?
9. Ni changamoto gani unakutana nazo katika kutumia vifaa vya TEHAMA wakati wa kufundisha na kujifunza?
10. Taja hasara za kutumia vifaa vya TEHAMA katika kujifunza na kufundisha.
11. Kama mwalimu unafanya jitihada zipi kuhakikisha unatumia vifaa vya TEHAMA katika ufundishaji na ujifunzaji?
12. Kuna mafunzo yeyote hutolewa kuwawezesha walimu kutumia TEHAMA katika ufundishaji?
13. Shule na uongozi wa Elimu wanasapoti vipi matumizi ya TEHAMA shuleni?
14. Unafikiri nini kifanyike kukuza matumizi ya TEHAMA?

Appendix IV: Focus Group Discussion

1. TEHAMA ni nini?
2. Je, shule yako ina maabara ya kompyuta?
3. Umewahi kuingia katika maabara ya kompyuta?
4. Taja vifaa vya TEHAMA ulivyowahi kuviona katika shule yako.
5. Je, mnatumia vifaa vya TEHAMA katika kujifunza masomo yapi?
6. Taja faida za kutumia vifaa vya TEHAMA katika kujifunza.
7. Je, kuna matatizo gani unapitia unapotumia vifaa vya TEHAMA kujifunza?
Yataje.....
8. Je, mtumizi ya vifaa vya TEHAMA yanakupa motisha katika kujifunza? Kwa namna gani?
9. Walimu na uongozi wa shule wanawasapoti katika matumizi ya TEHAMA?
Kwa namna gani?
10. Unafikiri kuna madhara au hasara za kutumia vifaa vya TEHAMA katika kujifunza?

Appendix V : Checklist on ICT usage in Public Primary schools

ICT available	No	Partially shown	Shown	Well shown
ICT lab				
Computer sets				
Internet connectivity				
Electricity				
Other source of electricity				
ICT Experts				
Frequency of ICT usage				
Projectors				
Timetable				
Tablets				
ICT handover contract				
Printers				
Photocopy machine				
Satellite dishes				
White boards				