

**TEACHERS' IN-SERVICE TRAINING ON ICT: PROSPECTS AND
CHALLENGES: A CASE OF BARIADI DISTRICT**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
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CERTIFICATION

The undersigned certifies that she has read and here by recommends for acceptance by the Open University of Tanzania a dissertation entitled: **“Teachers’ In-service Training on ICT: Prospects and Challenges: A Case of Bariadi District”** in partial fulfilment of the requirements for the Degree of Master of Education Administration, Planning and Policy Studies (MED-APPS) of the Open University of Tanzania.

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DECLARATION

I, **Maro Mtatiro Msami**, do hereby declare that this dissertation is my own work and that it has not been submitted and will not be presented to any other University for a similar or any other degree award.

.....

Signature

.....

Date

DEDICATION

This dissertation is dedicated to my beloved father, the late Mtatiro Msami and my aunt the late Nyanoko Msami together with my late grandparents. Their love and guidance were missed when I was pursuing my studies.

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ABSTRACT

This study investigated the challenges and prospects of teachers' in-service training in Bariadi district. This end was fulfilled by descriptive study design, which is mostly appropriate for social sciences research employing qualitative as a major approach to the study, as well as quantitative approach to collect and analyze data in order to address the main objective of the study. A sample of 62 teachers and 20 students was purposefully and randomly selected from 20 secondary schools. The objectives guided this study were: to explore teachers' opinions on the benefits of using ICT in teaching, to investigate the availability of ICT in-service training and facilities to assist teaching-learning in schools and to explore the limitations that hinder teachers from using ICT. The findings of the study revealed that, the use of ICT in teaching processes has benefits to teachers and learners in the entire process of teaching and learning. In addition, there is inadequate teachers' in-service training on ICT and lack of enough technical support as well as limited ICT facilities in schools. The study recommends that, teachers should be trained on how to use ICT in teaching, should develop positive attitude towards ICT use and the Ministry of Education and Vocational Training has to provide more funds to establish ICT facilities that will enable schools to attain infrastructures for teaching and learning process. In this study therefore, teachers' in-service training on ICT is seen as the solution to the barriers on the use of ICT towards effective teaching process.

Keywords: ICT, Pre- service Training, In-service Training

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LIST OF ABBREVIATIONS AND ACRONYMS

AASA	American Association of school Administrators
BECTA	British Education Communications and Technology Agency
BEST	Basic Education Statistics in Tanzania
CBET	Competence Based Education and Training
CFT	Competency Framework for Teachers
EMIS	Education Management Information Systems
ESDP	Education Sector Development Plan
FOSS	Free Open Source Software
ICT	Information and Communication Technology
IFETS	Informational Forum of Educational Technology and Society
MEST	Ministry of Education Science and Technology
NGOs	Non-Governmental Organizations
ODL	Open and Distance Learning
OUT	The Open University of Tanzania
TBC	Tanzania broadcasting commission
TCC	Tanzania Communication Commission
TCRA	Tanzania Communication Regulatory Authority
TTCT	Tanzania Telecommunication Company Limited
TPTC	Tanzania Posits and Telecommunications Corporation
UNESCO	United Nations Education Scientific and Cultural Organization

CHAPTER ONE

INTRODUCTION TO THE PROBLEM

1.1 Introduction

This chapter covers the overview of the study, which includes the background information to the problem, statement of the problem, objectives and the research questions which guided the researcher and the significance of the study.

1.2 Background to the Problem

Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use technologies in their teaching (IFETS, 2017). While new technologies increase teachers' in-service training is needed to offer part of the solution. ICT can provide more flexible and effective ways for professional development for teachers, improve pre- and in-service teachers training and connect teachers to the global teacher community (IFETS, 2017).

Various efforts have been done in the education system to improve teaching and learning process through the use of Information and Communication Technology (ICT). The efforts included various training programmes that have been introduced in the education system. However, studies show that the use of ICT in teaching is still unstable in secondary schools. The study in Uganda for instance, mentions that the training of teaching staff in the pedagogical issues should be increased if teachers and administrators are to be convinced of the value of using ICT in their teaching-learning process (Guma, 2013).

Because the use of interactive technology in the classroom continues to rise, it is time to examine teacher and other personnel awareness of the types of support needed for effective accomplishment. There is now an irreparable trend among countries in Asia and Pacific to transform their teaching force and educational staff into technology literate and skilled workers. In almost all countries in the region, including emerging countries, teachers in primary, secondary and tertiary levels are being trained in the use of ICT in education with varying degrees and scope. ICT in education can help individuals to compete and adapt to the knowledge and information society by achieving the 21st century, which can enhance skilled work force and social mobility (UNESCO-UIS, 2015).

Teachers' in-service training on ICT is one of the most ways to help teachers to integrate ICT facilities into classroom teaching. Many researchers in their studies have discovered that whether trainee or skilled, ICT training programs develop teachers' competences in computer use (Shaibou and Kenton, 2015; Franklin, 2007; Wozney et al., 2006) influences teachers' attitudes towards computers (Hew and Brush, 2007; Keengwe and Onchwari, 2008) as well as assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008).

Pellegrino (2007) claim that teachers may adopt and integrate ICT into their teaching when training programs concentrate on subject matter, values and the technology. Educators who integrate technology with new teaching practices obtained through professional training can transform the performance of the students (Lawless and Pellegrino, 2007).

In Tanzania, ICT is a contemporary agenda in the education system where as the introduction of various training programs are notable in the Tanzanian education system (MOEVT, 2014). Various studies stresses that, in all systems, action in the field of teacher training (both initial and in-service) is a top priority as regards the inclusion and the use of ICT in the education system (European Commission, 2001). Most countries aim to offer ICT training that varies widely in content, duration and mode of delivery, at several levels, in an effort to address both basic computer skills as well as the pedagogical incorporation of ICT into the educational process (BECTA, 2008; White M., 2018).

The Ministry of Education and Vocational Training (MoEVT) for instance introduced the ICT pedagogy in Tanzanian Teachers' Colleges (TTCs) in 2005 as one of the necessity to equip teachers with relevant skills and competences on ICTs integration in teaching and learning (MoEVT, 2005). ICT subject in TTCs is regarded as a way of improving teaching and learning in schools because teachers would access knowledge and skills to use ICT facilities to enhance their teaching. Teacher training courses, both pre and in-service, can help teachers who are tentative to move faster and adopt technology while they show enthusiastic teachers new ways in implementing ICT into their profession.

The courses aim to improve teachers' ICT proficiency at three levels: ICT skills, pedagogical skills, and curriculum training (Alutaibi, 2003). However, limited studies have been conducted since the introduction of ICT curriculum in TTCs as well as after the initiation of various in-service training programmes in schools as to how they have enhanced the teaching and learning process.

1.3 Statement of the Problem

The introduction of ICT in education has a lot of benefits. The acquisition of new literacy skills is important if we are to successfully prepare our students to participate in a constantly evolving technological landscape (ISTE, 2016). Haddad and Drexler (2005) posit that ICT make valuable contribution to various aspects of education development and effective learning through expanding access, promoting efficiency, improving the quality of learning and enhancing the quality of teaching. According to Tinio (2003), appropriate use of ICT allows for collaborative learning where students interact with other students, teachers and experts regardless of where they are.

Literature studies (Tedla, 2012; Makgato, 2012) reveal that, the successful integration of ICT in teaching and learning largely depends on teacher competency, availability of ICT training, infrastructure and teachers' adoption and embrace of ICT in education. In-service Training programs for employees on work performance are very essential in public organizations (URT, 2012). Audu, Gunjun, and Ahmadi, (2014), indicated that training is required for employees work performance in secondary schools. The public organization has been forgotten in government training and development program (URT, 2013). Effectiveness of teaching and learning however, depends on effective methodologies and availability of facilities. One of the objectives of implementing ICT teachers' training programmes was to bring among other important issues, the notable improved teachers' teaching practices that will enhance the improvement of lives of people in Tanzania (MOEVT, 2014).

Hence ICT implementation in schools is considered vital for the sustainable development of education system (Sodhi, 2013). The ICT teachers' in-service training

programmes enable teachers to acquire relevant teaching knowledge and skills. How effective ICT is in assisting the teaching process is yet to be known in Bariadi District Councils, so this study intended to address the teachers' in service training prospects and challenges focusing on: benefits of using ICT to facilitate teaching, availability of ICT professional development for teachers and facilities at schools as well as limitations of using ICT to facilitate teaching in 20 selected secondary schools from Bariadi District.

1.4 The Objectives of the Study

1.4.1 General Objective of the Study

The general objective of this study was to explore the prospects and challenges of teachers' in-service training to go hand in hand with the advancement of Science and Technology for teaching and learning process in Tanzania secondary schools specifically in Bariadi district.

1.4.2 Specific Objectives

The specific objectives of the study included the following;

- (i) To identify the importance of teachers' in-service training for teaching and learning process in secondary schools.
- (ii) To investigate the availability of ICT professional development and facilities and how they assist teaching-learning process in schools.
- (iii) To find out the limitation of using ICT in teaching and learning process in secondary schools.

1.5 Research Questions

1.5.1 Main Research Question

What are the prospects and challenges of ICT teachers' in-service training in the teaching and learning process in Bariadi District?

1.5.2 Specific Research Questions

The following were research objectives:

- (i) What are the benefits of teachers' in service training on ICT in assisting teaching and learning process?
- (ii) What kind of teacher's ICT training and facilities are available in schools to assist teaching and learning?
- (iii) What are the limitations of using ICT in teaching and learning process in secondary schools in Bariadi District?

1.6 Significance of Study

The findings of this study help to address the effectiveness of using ICT in teaching and learning, the way forward in ensuring availability of ICT in-service training and facilities and the existing limitations in using ICT during teaching and learning in secondary schools. Also, educational stakeholders in the country, policy makers and decision makers can be informed about the use ICT for effective teaching and learning process in classrooms and therefore take the necessary steps in improving ICT in-service training for teachers as well as availability of ICT facilities in schools.

Moreover, the study will convey a message to the government through MoEVT in facilitating the use of ICT for effective teaching and learning by ensuring teachers' in-

service training and development to make sure that there are competent teachers who are using ICT in teaching. The government in collaboration with educational investors can find a way of making ICT facilities available in schools.

1.7 Scope of the Study

Specifically, the study was based on the importance of teacher's in-service training on ICT towards effective teaching and learning process. The study was conducted in Bariadi district in Simiyu region where by schools were surveyed.

1.8 Limitation and Delimitation of the Study

Because of this objective, the nature and size of the sample and data collection technique and tools, the study comprised the following issues, some of the respondents were reluctant to provide information during the study because of fear, as most respondents thought that, the researcher being a civil servant in the area, wanted to harm them due to their poor performance. Minimizing this limitation, the respondents were assured that the information they provide were confidential and would be used for academic purpose only. Also most of the schools were not enriched with ICT services hence it was not easy to select the sample suitable for the study. Carefully investigation was done to sample schools that were seen to have ICT facilities however limited they were.

Moreover, the researcher was faced with the challenge of limited time for interviewing the respondents required and collecting the questionnaires. That is why the study was conducted in Bariadi district in few schools in order to minimize resources.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a literature review in relation to the study. The reviewed literature functioned as a guideline for the study. The literature is discussed under the following subtopics: benefits of using ICT in teaching process, the availability of ICT in-service training for teachers and facilities as well as the limitations of using ICT to facilitate teaching.

2.2 Theoretical Literature Review

The following are the theories that are related to this study.

2.2.1 Theory of Performance

The Theory of Performance (ToP) was developed by Elger, (2010). He develops and relates six foundational concepts to form a framework that can be used to explain performance in training of the public organization employees as well as performance improvements. To perform is to produce valued results. According to Bransford, et al, (2000) a performer is a public organization employee that engages in a collaborative work performance. Developing performance is a journey and level of performance describes location in the journey. Current level of performance of public organization employees depend holistically on components; context, level of knowledge, levels of skills, level of identity, personal factors and fixed factors. Three axioms are proposed for effective performance improvements. These include performer's mindset, immersion in an enriching environment and engagement in reflective practice.

2.2.2 Rationale for a Theory of Performance

Humans are capable of extraordinary accomplishments. Gandhi led a nonviolent revolution that liberated India from colonial rule. On September 12th, 1962, John F. Kennedy challenged the country to “go to the moon in a decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills.” Wonderful accomplishments also occur in day- to- day practice in higher education. An advisor inspires students to follow their dreams. A teacher magically connects with students. Since worthy accomplishments are produced from high level performance, a theory of performance (ToP) is useful in many learning contexts. As a teacher advances his levels of performance, he is able to produce deeper levels of learning, improved levels of skills development and more connection with the class while spending less time doing this.

2.3 Empirical Review of Literature

2.3.1 Meaning of ICT

The acronym ICT stands for Information and Communication Technology and is defined as a “diverse set of technological tools and resources used to communicate, to create, disseminate, store and manage information, (Blurton, 1999). These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephone. Teaching process is a means through which the teacher, the learner, the curriculum and other variables are organized in a systematic manner to attain pre-determined goals and objectives. Because access to digital tools, applications, and networks continues to grow worldwide and media are increasingly available in digital form, use of ICT in education is expected to increase dramatically.

As stated by Daniels (2002) ICT have become within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. As described in the United Nations, (1999) report, ICT cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities. Rouse (2015) defines ICTs as an umbrella term that cover communication devices or applications that include computers, televisions, radios, networks, satellites, video conferencing and e-Learning. She also added that ICTs are always talked about in a particular context, like ICTs in education, libraries, health, and so on.

According to elm global (2014), ICTs in education means teaching and learning using ICTs. Educational ICT tools are divided into three categories namely: input source, output and others. Input source include such things as Personal computers (PCs), Tablets, applications software, student response systems, visualize or document camera. Output source refers to such devices as projector, interactive boards, monitors, display, Television. Others include digital camera, digital recorders, switchers and other technologies.

2.3.2 ICT Training and In-service Teachers

ICT professional development courses are integral to improve educational practices as they empower teachers with knowledge and skills required for integrating ICT in the classroom. Information and Communication Technology (ICT) is increasingly having

pervasive role and presence in the educational milieu as it continues to shape all aspects of our lives. Numerous reform projects have been in place aiming to infuse ICT across education systems. Teachers are widely believed to be the key agents of any educational change. Accordingly, the Jordanian Ministry of Education adopted several ICT training courses aiming to prepare teachers to integrate ICT effectively across the curriculum (Abuhmaih, 2011).

2.4 Benefits of Using ICT in the Teaching Process

Several studies from case studies to surveys have been conducted on the importance of ICT and as to why teachers need to use it. According to White and Shaibou (2018) literature reviews on different studies on ICT and learning have concluded that it has great potential to enhance achievements and learning among students and teachers. Wong et al., (2006) and Almani, (2017) point out that technology can play a crucial part in supporting face-to-face teaching and learning in the classroom. Many researchers and theorists assert that the use of computers can help students to become knowledgeable. Albugami and Ahmed (2015) observe that, throughout the years, countries have viewed ICT as the doorway to improving quality standards in education.

Osborne and Hennessy (2003) identify that new technologies may also help to increase student motivation, facilitate clearer thinking and develop interpretation skills with data. BECTA (2003) indicated that the success of the integration of new technology into education varies from curriculum to curriculum, place to place and class to class, depending on the ways in which it is applied. Here under are a few highlighted benefits of using ICT to facilitate teaching and learning process:

2.4.1 Individualized Interactivity

Traditional pedagogic methods focused on a passive one-way flow of information from teachers to students. World Bank (2004) reports that recent trends towards a constructivist approach to teacher-student interaction suggests that learning process can be enhanced through use of technologies which adapt the presentation of needs, preferences and requests. Due to the interactive nature of most of the ICT technologies, it is well suited for creative learning approach in which experimentation and creative thinking skills are emphasized.

2.4.2 Delivery of Educational Resources

ICT can be used to provide immediate up to date resources using one or more media to large numbers of educators and learners easily and relatively cheaply. Tinio (2003) asserts that ICT has the ability to transcend time and space making possible asynchronous learning. Online materials can be accessed 24 hours a day, seven days a week. ICT has enabled instructions to be received simultaneously by multiple geographically dispersed learners to be able to access resource persons, learning resources, mentors and professionals from all over the world.

2.4.3 Access to Global Knowledge Base/Internet

Perhaps the clearest benefit to education from ICT according to World Bank report, (2004) comes from ability to share knowledge experiences with an emerging networked global community. Students can actively search for their counter parts in other countries to develop joint research projects on a variety of topics for instance environment or health issues. The same technology allows students and wider community access to both global and local cultural resources.

2.4.4 Facilitating Interaction with Resources

Teachers remarked that interactive technology allows for more engaging, exciting and diverse lessons (Uluyol; Sahin, 2016). According to Bullock (2004) ICT provides educators with a wide range of very interesting opportunities for creating resources that allow learners high levels of interactivity. This can lead to creation of interesting and exciting interaction of learners with educational resources.

2.4.5 Simplify Teaching Job

Plomp et al., (2007) states that, use of ICT tools such as videos, television and multimedia computer software that combine text, sound and colourful moving images can be used to provide challenging, authentic content that will engage students in the learning process.

According to the study conducted by Hargrove (2019), it is revealed that the use of technology can have a positive effect of student motivation and engagement as well as overall classroom productivity. Moreover, networked computers with internet connectivity can increase learner motivation as it combines the media richness and interactivity of other.

2.5 Availability of ICT In-service Training for Teachers and Resources

Successful implementation of ICT based teaching and learning depends largely on the positive interest of teachers, who eventually determine how they exploit and implement ICT based teaching in the classroom (Bullock, 2004). In order to ensure that ICT is widely adopted and used in classrooms in secondary schools, the following practices should be taken into consideration.

2.5.1 Professional Development or In-service Training

According to the study done by Mwalongo (2011) the level of teachers' competence in employing ICT in teaching and learning process was found to be influenced by computer training whose duration ranged from two weeks to six months. The study revealed that only 4% of teachers received in-service training as part of their courses after collage while 96% have not received any in-service training since their collage training. Several attributes compliment professional development and in-service training success including the following:

2.5.1.1 Attitude Towards ICT

Drent and Meelissen (2007) in their study have established that a positive ICT attitude has a direct positive influence on the innovative use of ICT by the teacher. Positive attitudes often encourage less technologically capable teachers to learn the skills necessary for the implementation of technology-based activities in the classroom. Therefore, if teachers want to successfully use technology in their classes, they need to possess positive attitude to use technology. Such attitude is developed when teachers are sufficiently comfortable with technology and are knowledgeable on its use.

2.5.1.2 Competence in ICT Use

Van et al., 2004 define ICT competence as the ability of handling various applications on ICT for more than one purpose. According to Bordbar (2010) one of the major predictors of ICT integration into teaching is competence of the teacher and this helps a lot in successful integration of ICT in teaching. According to Pelgrum (2001) and Angeline (2019), the success of educational innovations depends largely on the skills

and knowledge of teachers. Also, he found that teachers' lack of knowledge and skills was the second most inhibiting obstacle to the use of ICT in teaching. Knezek and Christensen (2000) postulated that educators with higher levels of skill and knowledge in using ICT would exhibit higher levels of using ICT to facilitate teaching in the classroom. Moreover, Berner (2003) concluded that teachers should develop their competence based on the educational goals they want to accomplish with the help of ICT.

2.5.1.3 Teachers' Working Experience

Gorder (2008) reported that teacher experience significantly correlated with the actual use of technology. Also, Baek, Jong and Kim, (2008). Similarly, in United States, the U.S National Centre for Education Statistics, (2000) reported that teachers with less experience in teaching were more likely to integrate computers in their teaching than teachers with more experience in teaching. Likewise, Mathayo, (2016) on Teachers' Experience in ICT Use in Teaching and Learning in Secondary Schools, also reports that, teachers with more experience in teaching did not prefer to use ICT tools in their classes.

2.5.2 Availability of ICT Resources

The study focused on availability of resources to support teachers in their use of interactive technology to engage students in learning. Because the use of interactive technology in the classroom continues to rise, it is time to examine teachers and other personnel awareness of the types of support needed for effective integration of interactive technologies during teaching and learning processes. In almost all countries in the region, including emerging countries, teachers in primary, secondary

and tertiary levels are being trained in the use of ICT in education with varying degrees and scope (UNESCO-UIS, 2015).

According to Ngwu (2014), most ICT resources are not adequately available in schools. This therefore implies that, even though teachers can be adequately trained and willing to impart the knowledge they have to students, they are blocked from doing so by this lack of technological equipment and laboratory facilities.

2.5.3 Availability of Technical Support

BECTA, (2004) agreed that if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns. Jones, (2004) reported that the breakdown of a computer causes interruptions and if there is lack of technical assistance, then it is likely that the regular repairs of the computer will not be carried out resulting in teachers not using computers in teaching. The effect is that teachers will be discouraged from using computers because of fear of equipment failure since no one would give them technical support in case there is technical problem.

2.6 Limitations that Hinder Teachers from Using ICT in Classrooms during Teaching

The act of integrating ICT into teaching is a complex process and one that may encounter a number of difficulties. Schoepp, (2016) defines barrier as any condition that makes it difficult to make progress or to achieve an objective. There are several factors that inhibit the use of ICT into classroom instruction. Some factors are school based (internal) while some are community based (external) and teacher's personal

issue. Studies identify these factors as non-manipulative and manipulative factors. Non-manipulative refers to the factors, such as age, teaching experience and computer experience. Manipulative factors are availability of ICT infrastructures, government policy and the availability of external support; attitude, phobia, interests and skill level in using computer. According to Kiwonde (2018), it is revealed that, one of the critical challenges teachers are currently facing is lack of ICT teaching and learning facilities.

2.7 Studies Done in Different Countries

2.7.1 Studies Done in Developed Countries

According to the study by AJER, (2015) Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies in their teaching.

While new technologies increase, teachers seem to lack knowledge and skills of using ICT in teaching. A study by IFETS, (2005), on ICT indicates that ICT can provide more flexible and effective ways for professional development for teachers, improve pre- and in-service teachers training while connecting teachers to the global teachers' community and Information Forums on Education Technologies.

There are a variety of interactive technologies used in school classrooms. Interactive whiteboards have been employed in elementary classrooms since the 1990 (Miranda and Russell, 2012). Student to-computer ratio was close to 4:1 in 2008 (Clausen, Britten, and Ring, 2008), and hundreds of school districts have implemented 1:1 iPad or Chrome book programs. Even though billions of dollars are spent on technology

equipment in the schools, teachers are not using technology to its full potential (Smith and Throne, 2007).

The American Association of School Administrators reported that principals had great concerns about the low usage of technology in their schools (AASA, 2014). The gap between teachers' knowledge of the enhancement of instruction and the pedagogical use of technology in classroom teaching is unknown. A great number of classrooms have interactive devices available for use, but they are not used due to a variety of concerns such as: lack of teacher training, little to no planned support and technical issues (Herold, 2017). Some school districts have paired the implementation of interactive devices with quality support for teachers in the classroom in their use of technology (Herold, 2017).

2.7.2 Studies Done in Developing Countries

ICT is regarded as a driver and enabler of economic development in most countries like Tanzania. Over the last 15 years, there has been a significant increase in the availability of ICT in developing countries. Indicatively, it is estimated that fixed wired broadband internet subscriptions have increased from 71 to 357 in between 2005 to 2013 (ITU, 2013). Most striking is the rapid up take in mobile telephones. Mobile phones subscriptions in developing countries have increased from 1213 to 5235 in between 2005 and 2013, while active mobile broadband subscription has increased rapidly from 43 to 1162 in between 2007 and 2013 (ibid, 2013). Almost all governments in developing countries have ongoing information systems, projects aiming at efficiency of administration and improvement of public sector services (Avgerous, 2016). NGOs are another key user of ICT in developing countries. The

expectations for developmental effects from the uses of ICT are high. They include contributing to economic growth, the enabling of the achievement UN Millennium Development Goals in Health and Education (Byrne et al., 2011).

The development of individual computer technology has proved a major turning point in the implementation of projects dependent on technology use, and calls for the acquisition of computer skills first by teachers and then by pupils. Between 1990 and 2000, multiple actions were started in order to turn technologies into a lever for improving education in sub-Saharan Africa. Many initiatives focused on equipping schools with computer hardware. A number of NGOs contributed, on varying scales, to bringing computer hardware into Africa, such as groups like Aid International, Digital Links, School Net Africa and World Computer Exchange.

Sometimes with backing from cooperation agencies or development agencies like USAID, the African Bank or the French Ministry of Foreign Affairs, these individual initiatives grew without adequate coordination. States found it difficult to define their national strategies with regard to ICT in Education (EFA Global Monitoring Report, 2012).

The Ministry of Education needs to build an education and training system that will support ICT integration in teaching and learning. It also needs to encourage and support one of the institutions to have students majoring in ICT as a teaching subject. The system must build teacher confidence in the use of ICT. Teachers need to have access to in-service training on how to integrate ICT into teaching and learning, (Nomsa, 2016).

2.7.3 Studies Conducted in Tanzania

In Tanzania, ICT is a contemporary agenda in the education system where as the introduction of various training programmes are notable in the Tanzanian education system (MOEVT, 2007). Various studies stresses that in all systems, action in the field of teacher training (both initial and in-service) is a top priority as regards the inclusion and the use of ICT in the education system (European Commission, 2001). Most countries aim to offer ICT training that varies widely in content, duration and mode of delivery, at several levels, in an effort to address both basic computer skills as well as the pedagogical incorporation of ICT into the education process.

MoEVT for instance introduced the ICT pedagogy in TTCs in 2005 as one of the necessity to equip teachers with relevant skills and competences on ICTs integration in teaching and learning (MoEVT, 2005). ICT subjects in TTCs are regarded as a way of improving teaching and learning in schools because teachers would access knowledge and skills to use ICT facilities to enhance their teaching. Teacher training courses, both pre and in-service, can help teachers who are tentative to move faster and adopt technology while they show the more enthusiastic teachers new ways in implementing ICT into their profession.

The courses aim to improve teachers' ICT proficiency at three levels: ICT skills, pedagogical skills, and curriculum training (Alutaibi, 2003). However, limited studies have been conducted since the introduction of ICT curriculum in TTCs as well as after the initiation of various in-service training programmes in schools as to how they have enhanced the teaching and learning process.

Different studies have indicated that ICT training on teachers has a great positive changes for them to cope with technological changes in teaching and learning process (Bauer and Kenton, 2005; Franklin, 2007; Wozney et al., 2006) influences teachers' attitudes towards computers (Hew and Brush, 2007; Keengwe and Onchwari, 2008) as well as assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008). Pellegrino (2007), claim that teachers may adopt and integrate ICT into their teaching when training programs concentrate on subject matter, values and the technology. Educators who integrate technology with new teaching practices gained through professional training can transform the performance of the students (Lawless and Pellegrino, 2007).

2.8 The Conceptual Framework

In light of the review of literature and discussion presented above, more research is required into the teachers' In-service Training on the use of ICT to facilitate teaching. A provisional framework has been developed, and is now presented, that may be used as the basis for such an investigation (Figure 2.1). The framework indicates the factors influencing the use of ICT to facilitate teaching and teachers' In-service training as a solution to the limitations.

The effective use of ICT in teaching and learning including the availability of ICT facilities in schools to accessibility of teaching and learning materials and proper record keeping has the positive impact of yielding effective teaching and learning process towards the improvement of learners' performance. Thus with this study, it is envisaged that effective teaching and learning process depends on teachers' in-service training on the use of ICT.

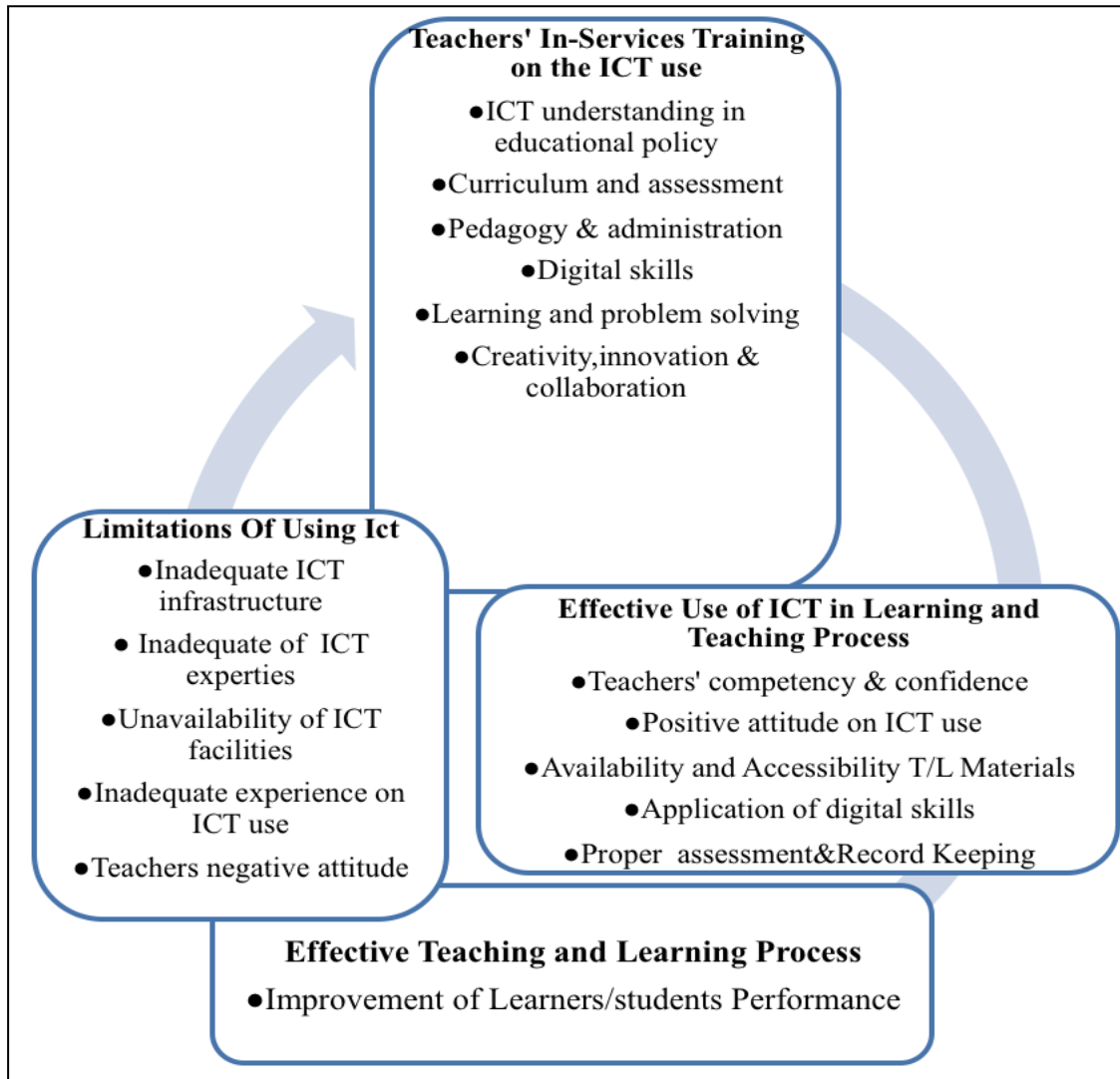


Figure 2.1: Conceptual Framework of the Study

Source: Modified from Mathayo. (2016)

2.9 Research Gap

The literature review indicates that cases of ICT use in classroom teaching have been studied in other countries in Africa and outside the continent. Most of these studies were conducted to assess the effectiveness of ICT usage in teaching. According to the study by AJER, (2015) Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies in their teaching.

While new technologies increase, teachers seem to lack knowledge and skills of using ICT in teaching. A study by IFETS, (2005), on ICT indicates that ICT can provide more flexible and effective ways for professional development for teachers, improve pre- and in-service teachers training while connecting teachers to the global teachers' community and Information Forums on Education Technologies.

However, study on the importance of teachers' in-service training on ICT for teaching and learning to go hand in hand with the advancement of science and technology in Bariadi district is done for the first time despite the fact that effectiveness of ICT in assisting teaching and learning is being seen in few secondary schools available in Bariadi district. This is an indicator that more studies are still required to be done so as to fasten the process of the government and other educational stakeholders to improve ICT facilities in schools and facilitate teachers' in-service training programs. Thus, this study aims at exploring the importance of teachers' in- service training on ICT for teaching and learning in secondary schools to go hand in hand with the advancement in science and technological changes.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on methods, which were used to conduct the research. The chapter covers the area of research design, coverage of the study population, sampling procedures and techniques, data collection instruments and data analysis procedures. Ethical issues were also taken into consideration.

3.2 Research Design

Kumar Ranjit, (2005) defines research design as a basic plan that guides the type of information to be collected, the source of data and phase of analysis of the research project. Bryman, (2008) discusses that research design provides a framework for the collection and analysis of data. Burns and Grove, (2001) describe the research design as a blueprint for conducting a study that maximizes control over factors that could interfere with the validity of the findings. The research design guides the researcher in planning and implementing the study to achieve the intended goal. The control provided by the design increases the probability that the study results are accurate reflections of the real situations.

A descriptive survey research design, which is mostly appropriate for social sciences research, and particularly a cross-sectional design was employed. This allows the collection of data on more than one case at one point at a time. In other words, cross sectional survey design involves many participants within a short period of time and it gives a wide chance to the respondent to express their idea or knowledge on the

problem. Descriptive survey research design presents an opportunity to fuse both quantitative and qualitative data as a means to reconstruct the "what is" of a topic. Trochim, (2006) states that, a descriptive survey design is a very valuable tool for assessing opinions and trends. The main purpose of a descriptive survey design is to obtain information from a defined set of people so as to generalize the sample results to the population.

In the case of this study, descriptive survey design was therefore seen appropriate because of involving many representatives, low costs and less time, convenient data gathering as closely associated with observational studies but not limited with data collection, observing the phenomenon in completely natural environment and the need of integrating the qualitative methods of data collection (Foxand Bayat, 2007).

3.3 Area of the Study

This study was conducted in Bariadi district. Bariadi district is among five districts found in the northern part of Tanzania in Simiyu region; the other districts are Maswa, Meatu, Itilima and Busega.

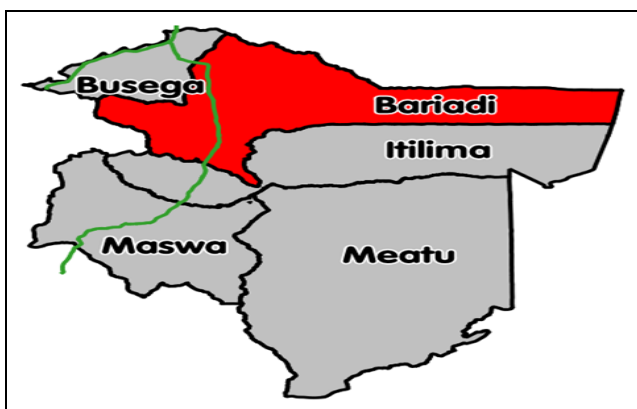


Figure 3.1: The Study Area Map

Source: Bariadi district (2019)

The study concentrated on the importance of teachers' in-service training on ICT for teaching and learning to cope with the advancement of science and technology in Bariadi district where two councils, Bariadi District Council and Bariadi Town Council were involved. The total of 20-secondary schools out of 40, which are from two councils thus, is to say Bariadi district Council (Dutwa Sec, Nkololo Sec, Ibulyu Sec, Miswaki Sec, Nyasosi Sec, Nkindwabiye Sec, Kasoli Sec, Byuna Sec, Gegedi Sec and Sapiwi) while from Bariadi Town Council (Bariadi Sec, Simiyu Sec, Ntuzu Sec, Mahaha Sec, Mbiti Sec, Giriku Sec, Kusekwa Memorial, Biashara Sec, Chenge Sec and Somanda Sec.) to represent the entire population.

The first 5 (2 from Bariadi DC and 3 from Bariadi TC) were purposively selected as they possess ICT facilities and for the rest were randomly selected from 13 different wards out of 31wards as the sample of many schools. Since some of the wards have no secondary schools, these 13 are among those with secondary schools. It should be noted that not all wards with secondary schools were included in the sample, some of them were left. This is because of avoiding choosing schools located in the same area. Although the schools were in different localities, they were similar in some aspects like class size, availability of teaching and learning materials and resources as they practice the same curriculum.

The major economic activities carried out by the indigenous people of Bariadi district include farming, which is mixed in nature. The local residence of Bariadi engages in livestock keeping where by animals such as cattle, goats and sheep are grazed on open land. The farmers also cultivate food crops such as sorghum, millet, sweet potatoes, maize, cassava, grand nuts, rice and beans. The only famous cash crop cultivated is

cotton. As per the population census of 2012, Bariadi district has a total population of about 1,584,157 whereas about 783,578.1 are males and 800,578.9 are females.

3.3.1 Criteria for Selecting Bariadi District

The reasons for selecting the area as my case study included: Possession of a very small number of schools which use ICT facilities in teaching and learning while no any ICT in-service training that has been conducted in the area. The area is well populated and there are many opportunities for use of ICT in teaching and learning as the essential factor that could improve effective teaching and raise the academic performance in the district and the region as well. Moreover, the nearness familiarity of the area by the researcher is also the factor that facilitated the selection. It is important to choose research area that is interesting to you professionally as well as personally (Saunders et al., 2012).

3.4 Research Population and Sample

Target population is the entire group of people to which the researcher wishes to generalize the study findings (Lewis, and Thornhill, 2012). Research population is the total set of observations from which a sample is drawn (Adeniyi et al., 2014). However, a sample is a small group of respondents drawn from a population that the researcher is interested in gaining target information.

The target population of this study included: Secondary schools' teachers and students with other few stakeholders. Teachers were targeted in this study because they are the major agents of ICT implementation in teaching process where as students are the learning agents. In this study the population gave out their opinions respectively.

3.5 Sample and Sample Size

The sample unit for the study consisted of 20 secondary schools in Bariadi District out of the total number of 40 secondary schools currently available in the District; this is half of the total population targeted. Both simple random sampling and purposive techniques were applied accordingly in the selection. The sample of 20 schools selected were comprised those which have ICT facilities within their campuses targeted to have the responses of nearly the same characteristics and those without enough ICT facilities to see if the challenges have close relationship involving absence of ICT usage.

The study targeted teachers in respective secondary schools although few educational stakeholders or leaders and students were also included in the sample size to represent all teachers and students in the district. A total of 100 respondents responded in either questionnaires or interviews. Questionnaires were for 62 teachers and 20 students only while interviews for 8 heads of schools and 10 other stakeholders due to time limitation in relation to the heavy duties they encounter.

The study involved 2 educational officers because there are two councils in one district, one from each council. 5 Ward educational officers 3 whose secondary schools have ICT classrooms, 2 without to check the difference in teaching effectiveness and if ICT training is provided, 3 ODL Teacher educators as education stakeholders using ICT in Teaching and learning process in Bariadi district, 8 heads of schools out of 20 in giving views about administration issues on the study topic to represent the population and 62 classroom teachers to sum up 70 teachers. For the students, the researcher decided to include one academic prefect from every school for

20 secondary schools as they are concerned in representing all students in academic matters.

Teachers N=70, Stakeholders (Educational leaders) N= 10, Students N= 20.

Table 3.1: Respondents of the Study

S/N	Respondents' Category		SEX			Data Collection Tool
			F	M	T	
1	District Educational Officer		1	1	2	Interview
2	Ward Education Coordinator		1	4	5	Interview
3	Educational stakeholders	ODL Teacher educator	-	1	1	Interview
		ODL Teacher educators	-	2	2	Questionnaire
4	Teachers	H/schools	1	7	8	Interview
		Teachers	22	40	62	Questionnaire
5	Students		10	10	20	Questionnaire
	TOTAL		35	65	100	

Source: Questionnaires and Interviews' Respondents (2019)

3.6 Sampling Methods

3.6.1 Purposive Sampling

Purposive sampling technique is a deliberate selection of particular units of the universe for constructing sample, which represent the universe (Mauya, 2006). It is also a technique based on the researcher's judgment and purpose of the study (Babbie, 1992) and it is usually used to select respondents who are rich in information. The study used purposive sampling to identify the respondents for this study. Purposive sampling was adopted for this study considering the researcher's available knowledge

concerning the sample subject; it provides control over significant variables of the study and homogeneity of subjects in the sample. This sampling method was adopted in order to allow the researcher to concentrate on people with particular characteristics who assisted the researcher with the relevant research.

Furthermore, purposive sampling offers advantages such as, it is easy to select a sample, it is not expensive, short time is used to select a sample and results of purposive sampling are usually more representative of target population compared to other sampling methods. The sample frame was divided into two groups of residential areas of Bariadi District Council and Bariadi Town Council. But also the population of each selected ward was divided into two segments of males and females who practiced educational provision. To get the sample, 5 schools were purposely picked.

The first 5 schools out of 20 were purposely chosen because of being ICT centre while the rest 15 schools were randomly selected. And to get respondents for the study the researcher purposely picked teachers with the help of the principals and heads of departments. Here the researcher was interested to find those teachers who were ready to participate, specifically second masters and academic masters, as their views and answers about questionnaires was important.

3.6.2 Random Sampling

Kombo and Tromp (2006) define random sampling as a process of selecting sample in such a way that all individuals in the defined population have equal and independent chance of being included in the sample. Simple random sampling intends to avoid any

kind of bias in selecting a sample. Random sampling was used to get 15 secondary schools out of 20 through lottery draw, as 5 were purposely selected.

3.7 Sources of Data

The sources of primary data for this study were teachers, educational leaders and students from 20 different secondary schools. In order to obtain primary data questionnaires and interviews were employed. Secondary data was collected by the method of analysis of documents. Such documents included official records, newspaper accounts, journals, reports, as well as the published data used in the review of outstanding literature.

3.7.1 Primary Data

Kothari (2004) defines primary data as data, which are collected freshly and for the first time and which happen to be original in character. The primary data for this study was obtained from teachers including educational officers and students through interviews and questionnaires.

3.7.2 Research Methods and Instruments

The study employed interview, questionnaire and documentary review as the methods of data collection. Instruments such as interview guides with semi structured questions and questionnaire sheets were prepared for data collection methods suggested by the researcher. The combination of all these methods was yield a triangulation approach that enables the researcher to have the relevant information for the study at hand.

3.7.3 Questionnaires

This is a data collection method, which almost always involves asking a given subject to respond to a set of oral or written questions (Debois, 2019). This is a systematically

prepared form or document with a set of questions deliberately designed to elicit responses from respondents or research informants for the purpose of collecting data or information. Questionnaires serve four basic purposes: to collect the appropriate data, make data comparable and amenable to analysis, minimizes bias in formulating and asking question, and to make questions engaging and varied. In this study a form of inquiry document, which contains a systematically compiled and well-organized series of questions intended to elicit the information, which will provide insight into the nature of the problem under study.

The questionnaires were distributed to teachers and students. Closed and open end questions were prepared to guide the researcher so as to enable respondents to provide exact responses as per the research study.

3.7.4 Interview Guides

Interview guide is a method of collecting data, which involves formal form face-to-face conversation between the researcher and a respondent (Kothari, 2004) or an important data gathering technique involving verbal communication between the researcher and the participants (Fox, 2009). Interviews become necessary when researchers feel the need to meet face-to-face with individuals to interact and generate ideas in a discourse that borders on mutual interest. It is an interaction in which oral questions are posed by the interviewer to elicit oral response from the interviewee. In this study interviews were adopted to help the researcher to gather relevant information from the teachers on their experience about use of ICT in teaching. Both structured and non-structured interview were adopted during gathering of data from respondents.

3.7.5 Administration of Research Instruments

The researcher administered all the research instruments to all respondents by himself. This allowed the researcher to collect first-hand information. Questionnaire sheets were distributed to teachers and students and they were given enough time to fill them. The researcher conducted an interview with guides to teachers including heads of schools or educational leaders and brief notes were taken for data analysis.

3.8 Data Analysis Techniques

Kombo et al., (2006) refers data analysis to the examination of data. Data analysis involves uncovering, extracting important variables, detecting any variances and testing underlying assumptions. Data gathered in this study were both quantitative and qualitative.

Primary data collected from the field were edited first to eliminate the misplaced responses to be given during the collection of the data. The responses were coded for analysis. Coding was done to summarize the responses given by the respondents for analysis. The coded items were analysed with the aid of a computer as a tool for analysis. Data to be collected through interviews were analysed by using themes approach. The responses information was first read by the researcher. Secondly, the data were placed in sub topics of the study as per the objectives of the study. That is all responses about the benefits, barriers were grouped together. Third step was to re-read the common patterns in each category, and decide which to take and which to leave out. Fourth, was to write narrates in each category using quotes from interviewees. The fifth step was to interpret narrates from respondents to gain meaning out of it. All categories of data were led by the research questions.

3.8.1 Validation of Data Collection Tools

Validity is an important aspect of an effective research. If research tools aren't valid may affect the effectiveness of a research. Therefore, validity of data collecting tool is very important for both quantitative and qualitative research (Cohen, 2007). Data collection tools validation involves determining the quality of data collecting tools or procedures that is able to measure what it is supposed to be measured (Kombo and Tromp, 2006). The experts in the area of study helped in improving the instruments. The experts' feedback in form of recommendations to the researcher, were incorporated in the final instruments. This was done randomly to colleagues of the researcher.

The purpose of piloting the instruments was to test the appropriateness of the items to the respondents in order to improve the instruments and enhance the validity of the instruments. The researcher will make use of the supervising experts to ensure proper guidance is given on the piloting of the instruments. Denscombe (1998) comments that, there is no research tool that is adequate in itself in collecting and validation of data. The study used more than one research instrument with expectation that one tool could complement the other.

3.9 Ethical Consideration

Ethics is typically associated with morality, and both words concern matters of right and wrong (Babbie 2007). This study considered the principles and roles that a researcher or investigator would observe before conducting the research such as informed consents, protection from harm, confidentiality and privacy.

Ethical consideration is an important factor to observe for any researcher, Cohen et al., (2007). Ethical principles in conducting research included acquiring clearance and the informed consent of the respondents as well as maintaining confidentiality. The researcher obtained a research permit from the Open University of Tanzania and Bariadi district authority to collect data in the sampled schools.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Introduction

This chapter deals with the key research findings on the teachers' in-service training on ICT prospects and challenges. The findings of the study are presented as per objectives of the study in three sections which guide the study: first, to identify the importance of teachers' in-service training on ICT for teaching and learning process to go hand in hand with the advancement of Science and Technology. Secondly, to investigate the availability of teachers' in-service training on ICT and facilities to assist teaching-learning in secondary schools and third, to explore the limitation of using ICT in teaching and learning process in secondary schools.

4.2 General Information on the Respondents

This section aims at tracking down the respondents' demographic characteristics to enable the researcher to establish the extent of judgment one might have on the area of study. According to the demographic characteristics that were tracked including gender, age and education background, these variables have very important contributions in expressing and giving views about the problem at hand; since age and gender have been included in the study due to the assumption that there is negative community attitude toward ICT use in teaching. The respondents were first asked to indicate their gender.

Table 4.1: Gender Information on the Respondents

Gender	Frequency	Percentage
Male	65	65%
Female	35	35%
Total	100	100%

Source: Field Data (2019)

From the findings of the study, it is clear that most of the respondents interviewed were male teachers. From the response 65 (65%) of the respondents are male while 35(35%) are female.

The findings also showed that the information collected was not biased in terms of gender composition thus the data collected was perceived to reflect ideas from the mixed gender composition.

4.2.1 Age of the Respondents

Age is an important variable in a given Tanzanian social situation, which is variably affected by any social or economic phenomenon, to establish the ages of teachers, they were asked to indicate their ages. Their age distribution is represented in Figure 4.1.

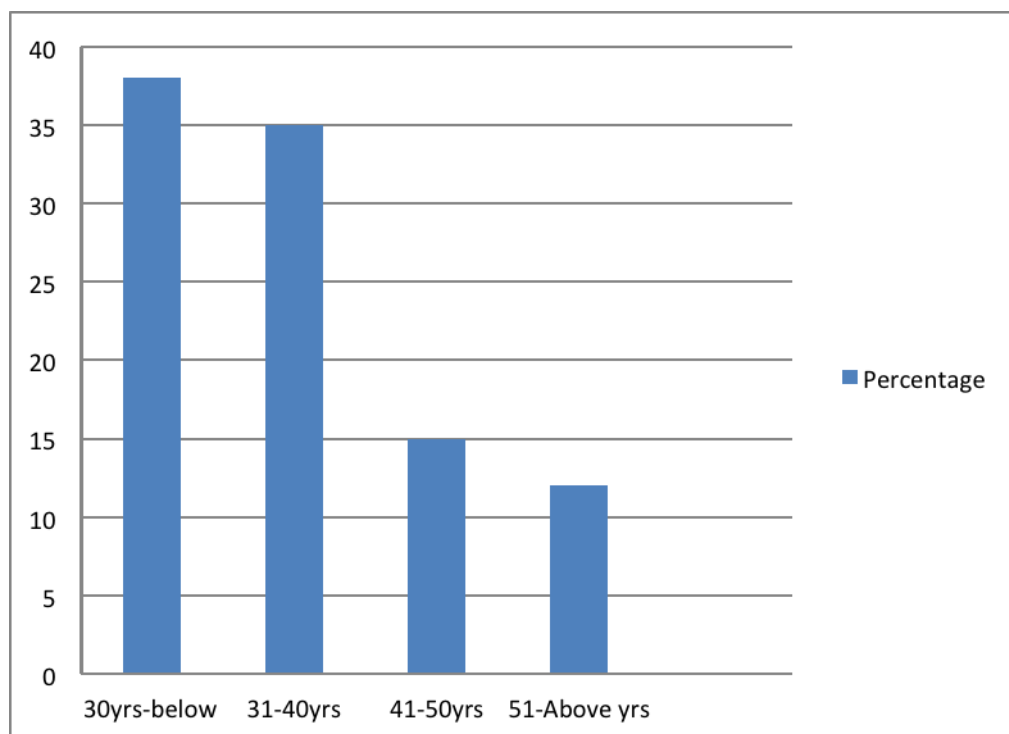


Figure 4.1: Respondents' Age

Source: Field Data (2019)

The results in figure above indicate that 38% of the respondents were in the age brackets below 30 years. 35% were in the age (31- 40 years) and 15% (41-50 years) respectively. Only 12% of the respondents were in the age bracket above 51 years. Majority of the respondents were therefore below 40 years.

4.2.2 Respondents Working Experience

The researcher intended to extract information on the years of working experience. The respondents were provided with questionnaires item, which required them to state number of years they have worked in the organization. In finding out the working experience therefore, the researcher grouped the respondents in groups of five years serving as workers. The results are 20 respondents (25%) have served for a period of more than 10 years, 35 respondents (44%) have served between 6-10 years and 25 respondents (31%) have served for a period of less than 5 years. The results are presented in Figure 4.2.

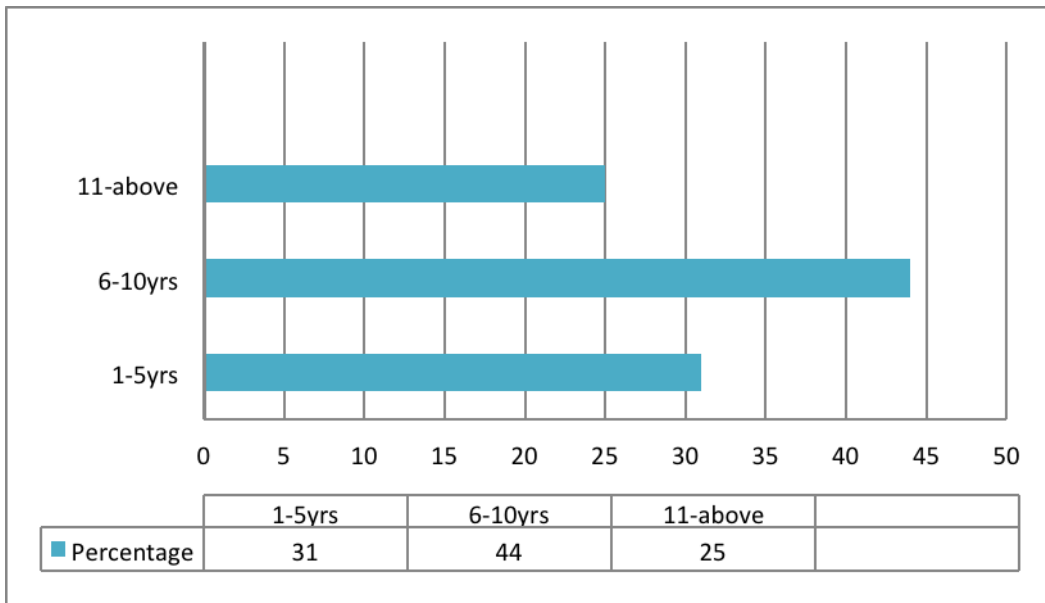


Figure 4.2: Respondents’ Working Experience

Source: Field Data (2019)

From the findings of the study, it can be said that most of the teachers had taught for at least a year hence they were perceived to be well informed about the ICT Training.

According to Dudzinski et al., (2000), teaching experience is developed over time and that teachers who have taught for a long duration are knowledgeable enough on teaching issues. This is because they are perceived to have the ability to relate prior knowledge to new experiences. Focusing on teacher experience, Clotfelter et al., (2006), found that teachers with more experience are more effective than those with less experience.

The researcher therefore considered the information given by the respondent to be reliable because most of the teachers had taught for a long period of time and therefore were considered to have information on their experiences on the use of ICT to facilitate teaching and learning in schools.

4.2.3 Respondents Educational Qualification

Respondents were further asked to indicate their highest level of education. The study findings in this are such that, 9% of the respondents are postgraduates' holders, 44% of the respondents had bachelor's degree and it was also found that 27% of the respondents are diploma qualification holders while 20% of respondents were certificate/ O-level holders. The findings of the study, indicate that majority of the respondents are degree graduates and therefore have qualified to teach secondary schools.

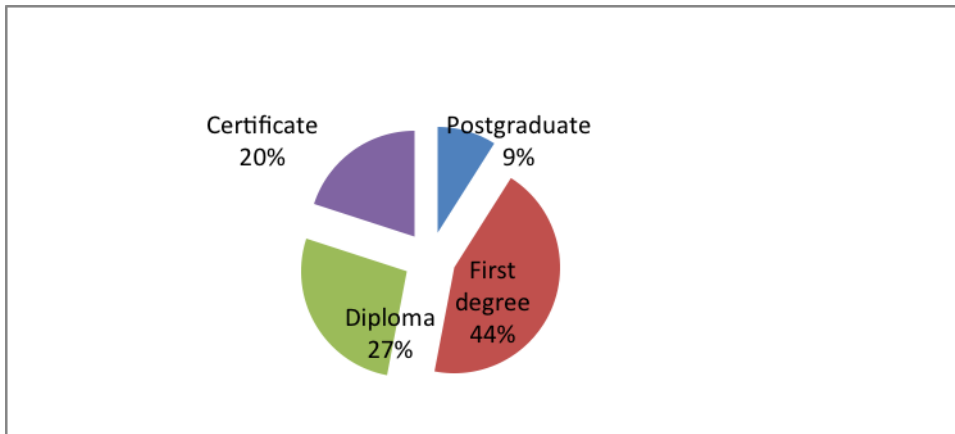


Figure 4.3: Respondents' Educational Qualifications

Source: Field Data (2019)

4.2.4 Respondents' ICT Training

On finding out if respondents have got any ICT in-service training, the study found that 96% of the respondents have not received trainings to use ICT in teaching and 4% said that they got training as they went back to the colleges for their professional development and others through their own efforts.

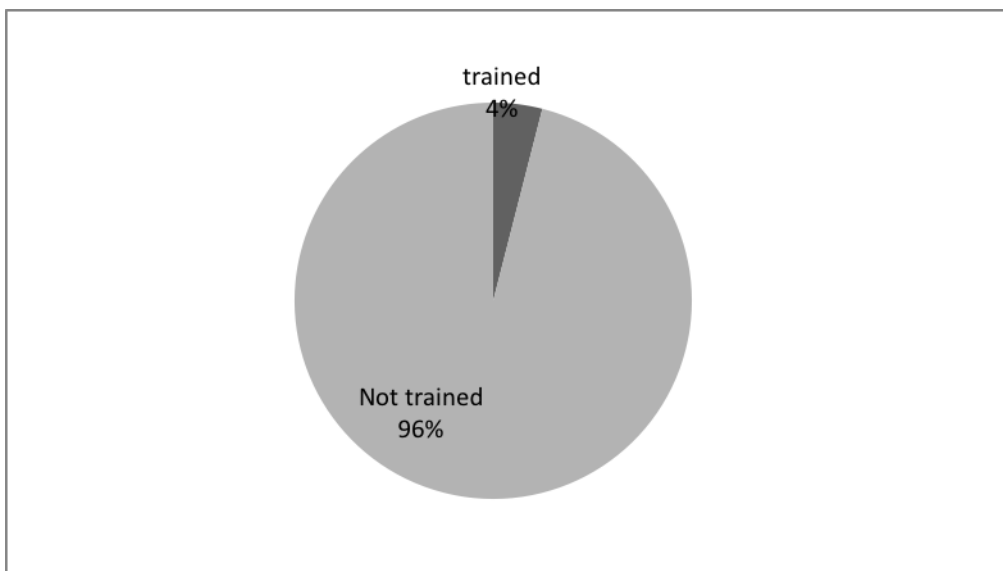


Figure 4.4: ICT In-service Training

Source: Field data (2019)

4.2.5 Level of ICT Use

In finding out the level of ICT technology expertise of the respondents, it was found that 60 out of 100 respondents that is 60% of the sample population were very comfortable working with ICT devices like computer, tablets and smart phones. 23 out of 100 respondents, which are 23% of the sample population were fairly comfortable using ICT devices and 17 out of 100 respondents thus 17% of the population were uncomfortable using ICT devices.

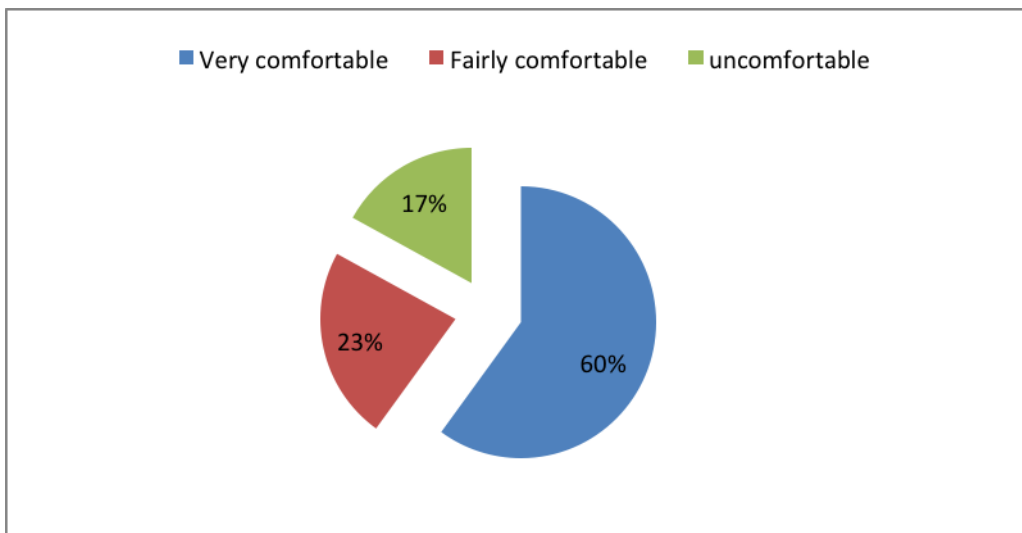


Figure 4.5: Level of use of ICT

Source: Field Data (2019)

From the findings it shows that 83% of the population are comfortable using ICT devices and are aware of the use of ICT to facilitate teaching.

4.2.6 Use of ICT in Teaching and Learning

In finding out if respondents do use ICT in teaching and learning process, the study found that 22 out of 100 respondents frequently use ICT in teaching and learning, 20 out of 100 respondents occasionally use ICT in teaching and learning process and 58 out of 100 don't use ICT at all.

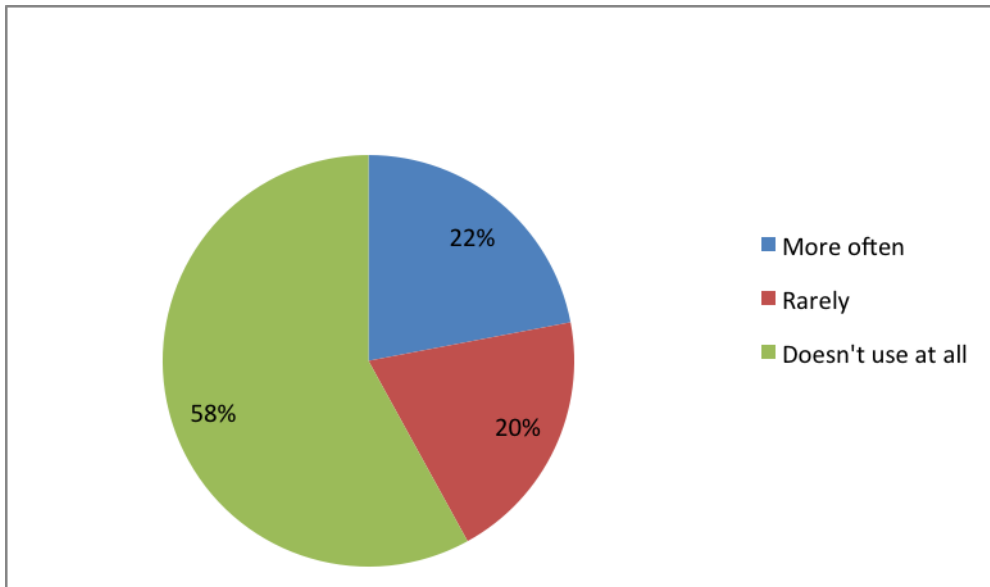


Figure 4.6: Use of ICT in Teaching and Learning

Source: Field Data (2019)

Critically, all data and information collected in the field were sorted and analysed. The information presented was obtained from one hundred respondents as shown in the Table 4.2.

Table 4.2: The Expected and Actual Number of Respondents Interviewed

CATEGORY OF RESPONDENTS	RESPONDENTS EXPECTED	RESPONDENTS INTERVIEWED	%
District Education Officer	2	2	100
Ward Educational Officer	5	5	100
ODL Teacher educators	3	3	100
Head of Schools	8	8	100
Teachers	62	62	100
Students	20	20	100
Total	100	100	100

4.3 Identification of the Importance of Teachers' In-service Training on ICT

To verify this assumption several respondents were involved through questionnaires and interview guides that were given to them. These included 20 students from 20 schools, 62 teachers, 8 head of schools, 3 ODL Teacher educators, 5 Ward Educational Officers and 2 District Educational Officers.

All respondents were supposed to explain about the benefit of using ICT in secondary schools teaching and learning process and to show its effects to the process of teaching and learning. Also the government officials were required to show their participation of ICT use in education programmes.

The respondents stayed with questionnaires for almost a month. This made them to have enough time to answer all questions freely without bias. Findings from the respondents showed that, there is a need of using ICT in teaching and learning. This is because, ICT facilitates increase in teachers' interaction and access to educational resources therefore simplifying teaching and learning process. 10 respondents (10%) said that ICT does not simplify teaching and learning job due to inadequate experience that they possess, unavailability of ICT facilities in their working place and inadequate ICT skilled personnel.

The interview was used to collect information from respondents' especially for educational leaders and ODL Teacher facilitators who were vested authority. All interviewees were supposed to identify the main benefits, barriers and suggest ways to improve the use of ICT secondary school teaching and learning process. The results on what are the benefits of using ICT in teaching are quantified as shown below;

4.3.1 ICT Makes Teaching Process Easier

The findings indicate that, 90% of the respondents agreed that use of ICT simplifies teaching, 10% disagreed (Figure 4.7).

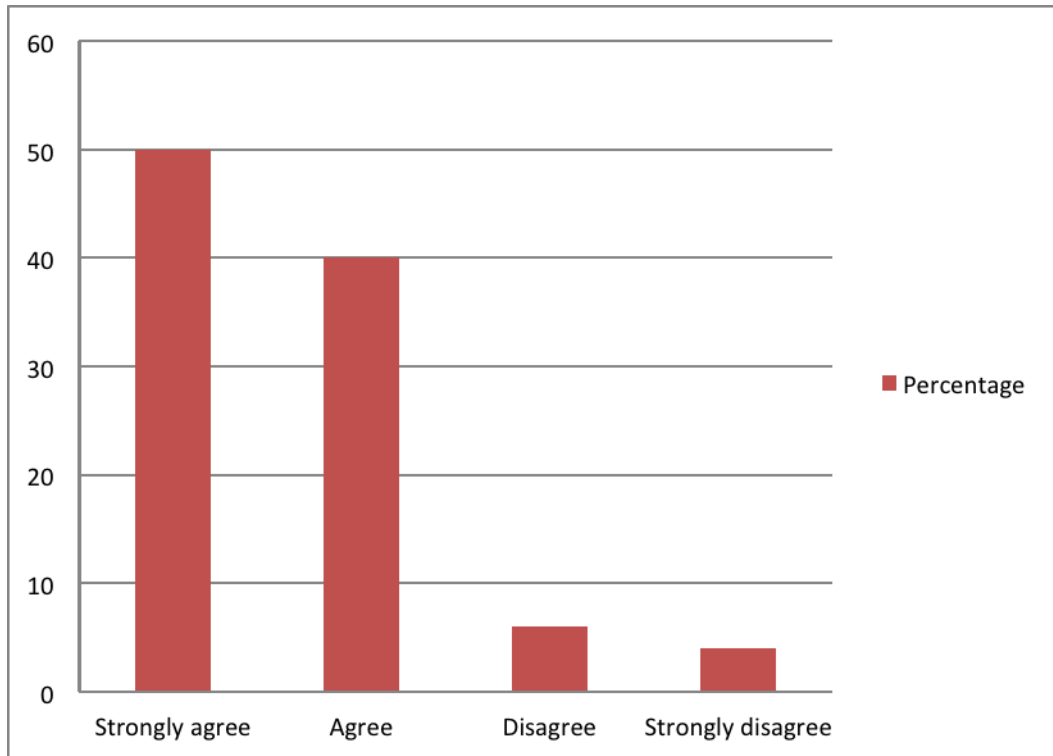


Figure 4.7: ICT Makes Teaching Process Easier

Source: Field Data (2019)

One of the heads of schools gave the following comments regarding importance of using of ICT to facilitate teaching and learning:

“Teachers in this school like using ICT in implementing curriculum. Some even use their own money to buy CDs with relevant information in their subjects and bring them to school with an aim of using them to teach students.” (Respondent no.1)

4.3.2 ICT Access to Education Resources

The results indicate that 93% of respondents agreed that ICT provides high access to education resources while 7% disagreed (Figure 4.8).

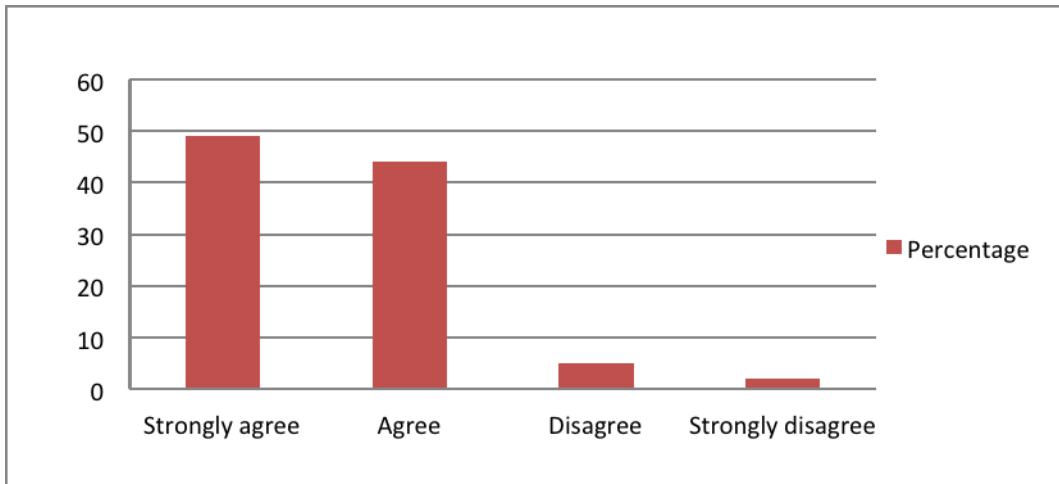


Figure 4.8: ICT Widens Access to Education Resources

Source: Field Data (2019)

A comment from a Physics teacher is presented:

“ICT has the ability to make learning to occur anytime at any place, through the use of ICT access to education has been widened and limitless, students can learn and get access to educational resources anywhere and at any time, exploring varieties of educational materials.

Internet materials such as virtual classes, virtual forums, audio books, electronic books, electronic libraries that are accessible 24 hours everywhere can be of great benefit. ICT have made education resources to be easily available, easily accessible and you just need a computer connected to the internet. I use ICT occasionally when I face difficulties explaining a concept; I would Google search the concept.” (Respondent No.2)



Figure 4.9: Students at Bariadi Secondary School Searching Materials through Internet Connected Computers

Source Field data (2019)

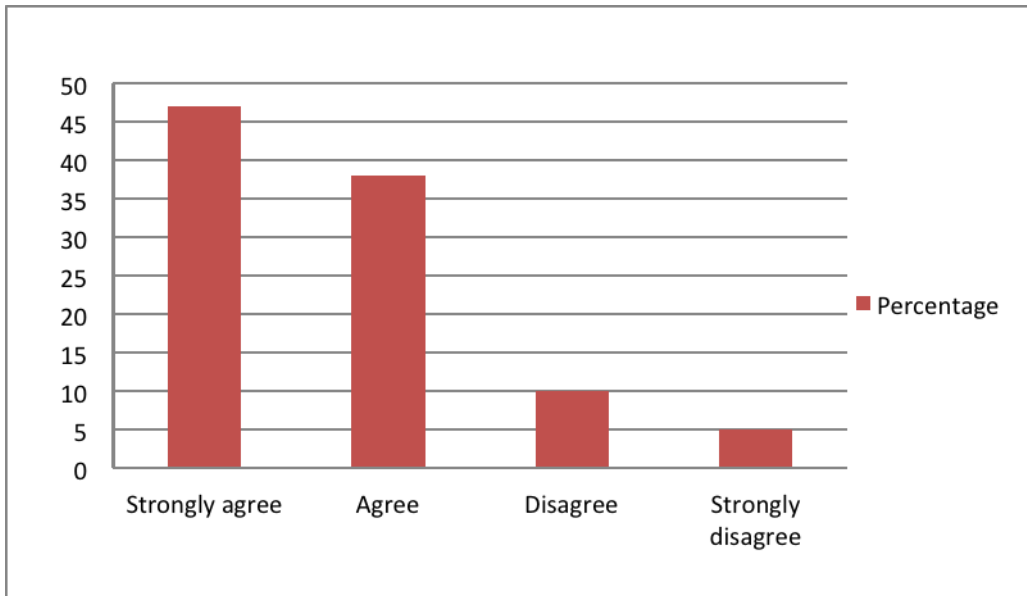


Figure 4.10: ICT Increase Teachers Interaction with Resources

Source: Field Data (2019)

The results indicate that, 85% of the respondents agreed that ICT increases teachers' interaction with resources while 15% disagreed (Figure 4.10).

“Through the use of ICT learners take control of the lesson and a teacher is there as a facilitator, use of ICT in classrooms is more of learner centric type of teaching” (Respondent No.3)

Moreover, another respondent said the following with reference to the benefits of using ICT to facilitate teaching and learning in secondary schools:

“The use of ICT to facilitate teaching has great potential to enhance student achievement and teacher learning. There are a bunch of ICT tools which when well used in classroom can turn a class into a place where students want to be. Mobile phones, tablets and mobile applications such as Edmodo, Mathmateer, my homework Student planner, English Grammar book, Math trick etc., which are available in Google Play for free for android users, can be downloaded and installed by the students in their phones and use while away from school” (Respondent No.4)

Another respondent sharing her views on the benefits of using ICT in to facilitate teaching process she said:

“By using ICT in a classroom learning becomes autonomous and interesting where learners are fully engaged within the lesson. With ICT, learning of difficult concepts becomes simplified and interesting. Imagine subjects like biology, physics and chemistry where a teacher may decide to use simulation software or short video clips to demonstrate a difficult concept to students through the help of internet. I have been able to research on different topics that I teach such as production, factors of production, demand and supply. All these materials are available online for free and they simplified my work and arouse students’ morale and interest towards the topic of discussion. ICT also can be used for preparation and planning, keeping students’ records and attendance monitoring. ICT is a potential tool for modern teaching and learning though it seems to be a service of few teachers” (Respondent 5).

4.4 Investigation of the Availability of Teachers’ ICT In-service Training and Facilities to assist Teaching-Learning in Secondary Schools

The questionnaires were administered to 84 respondents in three categories namely; centre facilitators, Classroom Teachers and students because of their roles, also, interview guides were conducted to 16 educational leaders due to their position. The results showed that, 96% of the respondents agreed that there is no in-service training given to them and 94% agreed that, there is unavailability of ICT facilities in secondary schools to the extent that teaching and learning is hindered.

4.4.1 Availability of Teachers’ In-service Training

According to the study done by Mwalongo (2011), the level of teachers’ competence in employing ICT in teaching and learning process was found to be influenced by computer training whose duration ranged from two weeks to six months. The results indicate that, 4% of the teachers agreed that they were trained on ICT while the rest 96% did not get in-service training on ICT (Fig.4.4.1) since they came from former colleges where many things have changed due to the growth of science and technology in teaching. Generally, there is unavailability of teachers’ ICT in-service training in schools to assist teaching.

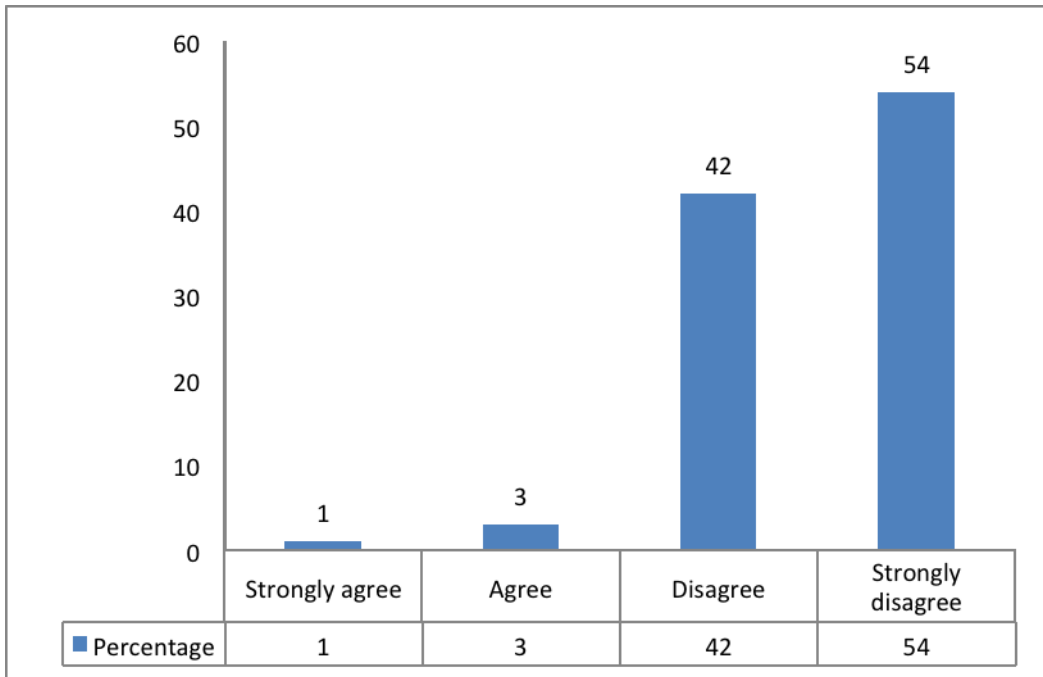


Figure 4.11: Availability of Teachers’ In-service Training

Source: Field data (2019)

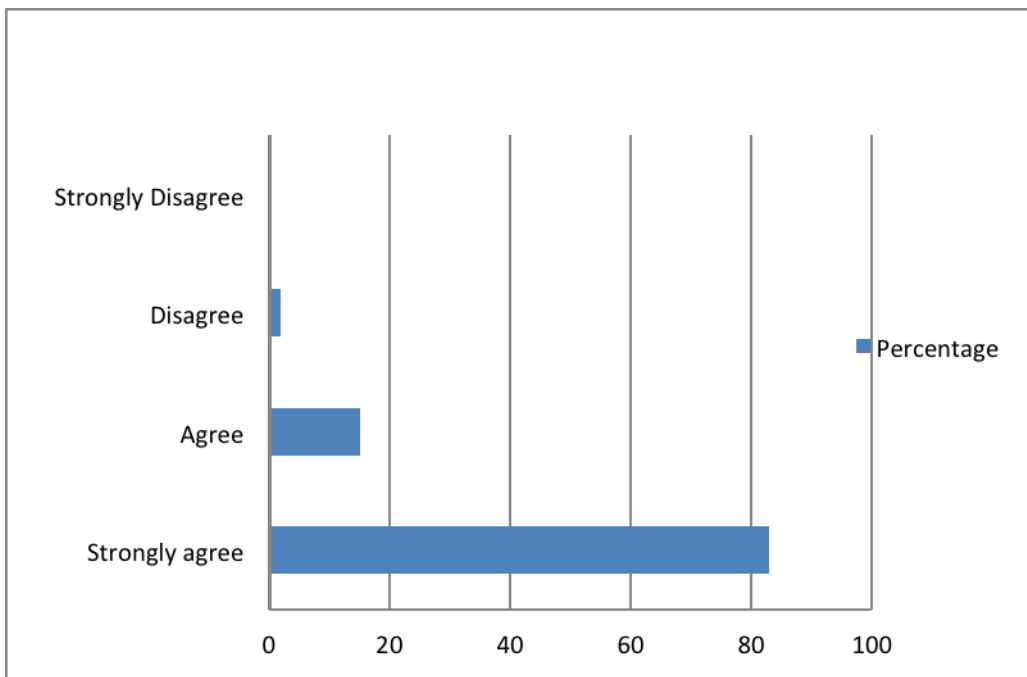


Figure 4.12: Availability and Access to ICT Facilities and Resources

Source: Field Data (2019)

The results show that, 94% of the respondents agreed on unavailability and inaccessibility of ICT facilities and resources hinders the use of ICT to facilitate teaching process in secondary schools, 6% disagreed (figure 4.4.2). This six percent is for those schools which are ICT centres in the district, which means that they have some computers although few. Commenting on ICT facilities, a respondent said:

“New technologies can be used to enable students to collect information and interact with resources, such as images and videos, and to encourage communication and collaboration but in our schools there is unavailability of ICT facilities to the extent that teaching and learning is hindered” (Respondent 6).

4.5 To Explore the Limitation of using ICT in Teaching and Learning Process in Secondary Schools

Information obtained from 62 teachers and 18 educational leaders (80%) of the respondents agreed that, teacher’s negative attitude towards ICT use in teaching is a barrier that hinders them from using ICT to facilitate teaching process, 20% of the respondents who were students were not sure.

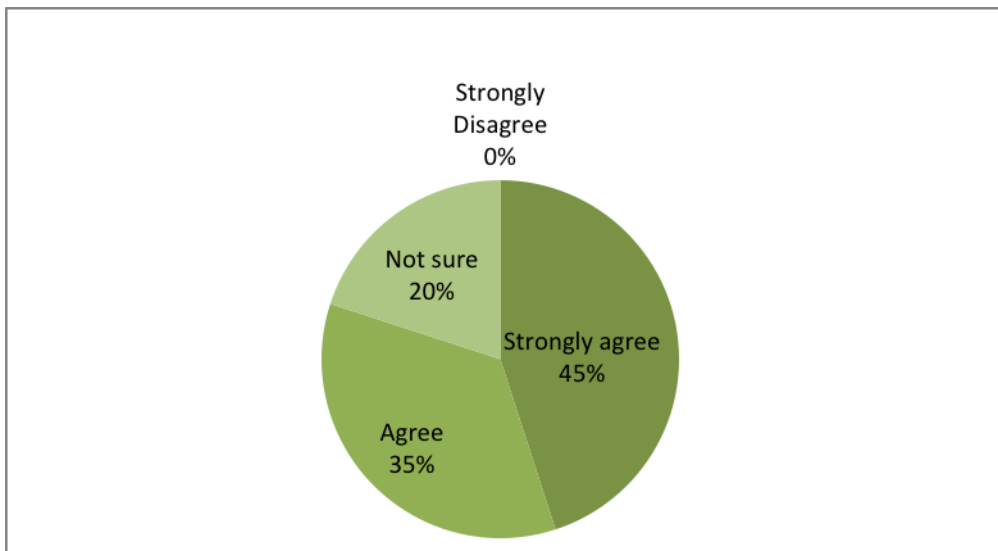


Figure 4.13: Teachers’ Negative Attitude Towards ICT

Source: Field Data (2019)

The results indicate that, 80% of the respondents agreed that, teachers' negative attitude towards the ICT as a barrier that hinders them to use ICT to facilitate teaching process, 20% (mostly were students) said that they were not sure, (Figure 4.13).

4.5.2 Teachers ICT Competence in Teaching Process

The results indicate that, 44% strongly agreed, 42% agreed giving a total of 86% of the respondents who agreed that teachers lack of ICT competence hinders them to use ICT to facilitate teaching, 14% of the respondents disagreed and said that the challenge is unavailability of ICT facilities and accessibility, things like electricity and computers (Figure 4.14).

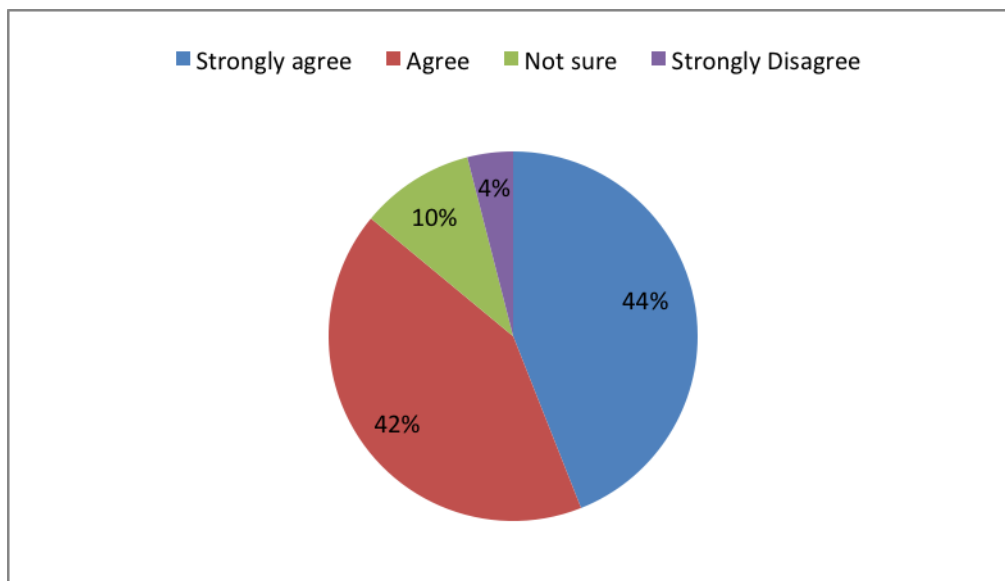


Figure 4.14: Teachers ICT Competence

Source: Field Data (2019)

4.5.3 Lack of Technical Support

The results indicate that 46% of respondents strongly agreed, 42% agreed, this is to say that 88% of the respondents agreed that lack of technical support hinders them to use ICT in teaching, while 12% of the population disagreed that for them lack of ICT

technical support was not the limitation on the use of ICT in teaching in secondary schools (Figure 4.15).

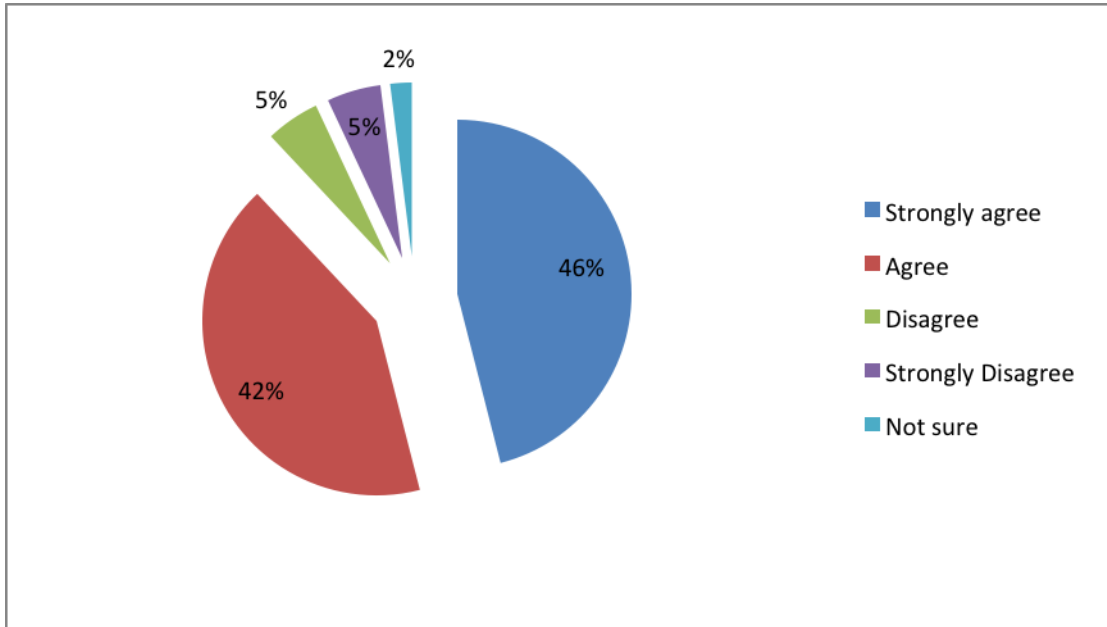


Figure 4.15: Lack of Technical Support Hinders the Use of ICT in Teaching

Source: Field Data (2019)

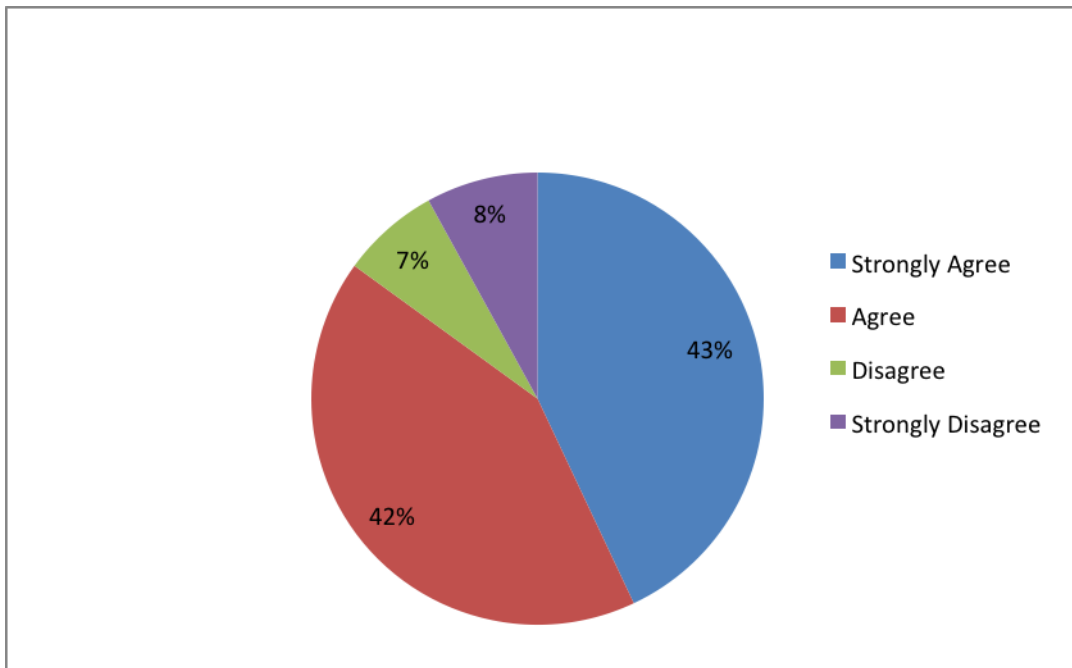


Figure 4.16: Insufficient ICT Resources Hinders Using ICT in Teaching

Source Field Data (2019)

The results indicate that, 85% of the respondents agreed that there are insufficient ICT teaching and learning resources in their schools, 15% disagreed as their schools have got ICT classrooms with few computers (Figure 4.5.4). A respondent giving her views on insufficient ICT teaching and learning resources said that:

“The use of ICT in teaching and learning is essential to both the teacher and the learner. As a teacher I can use websites such as You Tube and Google to search for relevant materials for my lesson and use them to teach the students. Everyone would like to integrate ICT in his or her lesson, the main challenge we face at our schools is that we have only one classroom with computers and a media room that is having a smart board and computer facility. If all classes could be facilitated with at least a projector we could use our own laptops”
(Respondent 7)

4.5.5 Inadequate ICT Training

The findings show that it is only 4% of the respondents particularly teachers who endowed to get in-service training on ICT the rest (96%) were not (Figure 4.16).

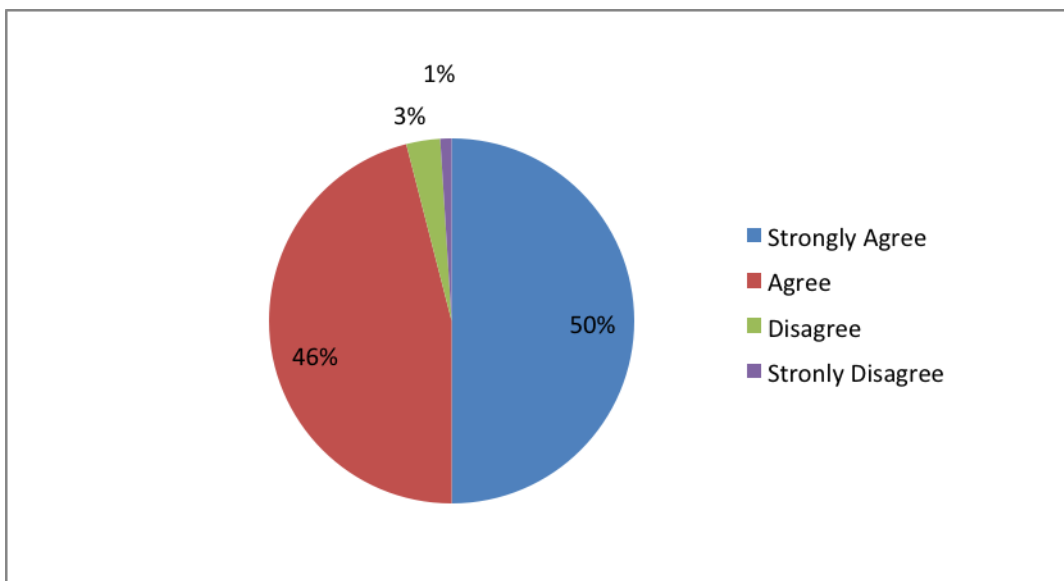


Figure 4.17: Lack of ICT Training on how to use it in Teaching

Source: Field Data (2019)

One of the respondents when asked to give views on the barriers of integrating ICT in facilitating teaching, he said:

“Lack of ICT competence and knowledge is my problem”, I have no enough skills to incorporate ICT tools in my lesson” (Respondent 8)

In responding to the interview another respondent said:

“I don’t use ICT to facilitate teaching and learning because I don’t know how to use ICT. The knowledge I have regarding using ICT is very basic to the extent that I lack confidence to use it in front of the students, but I do believe that through ICT my job as a teacher will be simplified and entertaining to my class. I think the school owners should organize seminars, workshops and short courses on how to integrate ICT in teaching processes. It is very important to introduce teachers and other education stakeholders to seminars and workshops on technology based teaching and learning” (Respondent 9)



Figure 4.18: A Teacher Taking Notice from the Chalk Board using a Smartphone after Writing in the Exercise Book as Lesson Notice for her Learners’ Future use

Source: Field Observation (2019)

Moreover, the following is a comment from another respondent:

“One of the barriers that hinder us to use ICT in teaching is lack of access to ICT facilities and infrastructures. Most of schools especially government schools either have inadequate ICT infrastructures or don’t have at all. Ministry of education should ensure that these infrastructures are available and train teachers to use them in classrooms. (Respondent No.10)

A comment from a teacher on ICT facilities was as follows:

“Not only computer and internet, the school could purchase a TV set and a DVD player and Multimedia CDs which are recorded with different subject topics, this can be used as supplementary materials for both teachers and students. CD’s like world encyclopaedia can also be used in classrooms.” (Respondent No.11)

A response from a head of school was as follows:

“Accessibility is one issue and usage is another issue, I think if there could be enough accessibility and awareness of the ICT infrastructures, teachers are ready to use ICT in their classes in our schools. All teachers have laptops, all classes are equipped with multipurpose whiteboard and some have Smart boards. Most of teachers here use ICT and we have a policy of giving loans for purchasing laptops where a teacher pays the loan from minor deductions from their salaries.” (Respondent No 12)

A response from another teacher was:

“Integrating ICT in teaching in government secondary schools is a myth and most of the government schools do not have ICT infrastructures at all. Even if a teacher wants to use his/her own laptop, there are no projectors and some classes having no power. I think the government should put more emphasis establishing ICT infrastructures in its schools.” (Respondent No.13)

Another teacher said:

“Most of us learnt to use ICT especially computers by our own, we search on the internet for references that matches our lesson and correlate with our lessons. This consumes a lot of time since I have to find free time to do so. I would advise provision of seminars and workshops on how to use ICT in classrooms.” (Respondent 14)

More suggestions from respondents to the interview question on which way to improve the use of ICT to facilitate teaching and learning were as follows;

“Teachers need to be introduced to ICT education earlier and the only time that they can get enough time to learn how to integrate ICT with their respective subjects is during their training course. My opinion is, ICT integration in education should be taught not only in teachers training colleges but also in their working places as teachers’ in-service development to solve the new challenges on technological growth.” (Respondent 15)

The respondent continued;

“The curriculum is silent about the use of ICT, I think curriculum developers should revisit the curriculum and introduce usage of ICT in teaching, we are in the 21st century and to achieve the Millennium Development Goals, I think use of ICT in education should be a number one priority. Allocate more funds on ICT projects, train teachers in uses and integration of ICT in teaching and learning and provide in-service trainings, seminars and workshops on the use of ICT in education.” (Respondent 16)

4.6 Chapter Summary

This chapter deals with the presentation of data for the study. The findings of the study are presented as per objectives of the study. The findings are presented according to the sections of the questions.

CHAPTER FIVE

DISCUSSION OF THE FINDINGS

5.1 Introduction

This chapter presents discussion of the findings of the study. The research questions lead the discussion to be organized under the following broad themes:

- (i) The benefits of using ICT to facilitate teaching in secondary schools.
- (ii) The availabilities of ICT in-service training and facilities to assist teaching and learning in secondary schools.
- (iii) The limitation of using ICT in teaching and learning process in secondary schools.

5.2 The Benefits of Using ICT to Facilitate Teaching and Learning in Secondary Schools

This section discusses the benefits of the use of ICT in teaching processes in secondary schools.

5.2.1 ICT Makes Teaching Process Easier

From the findings of this study as previously detailed in chapter 4 section 4.3.1, it is shown that the use of ICT in teaching makes the teaching easier. The study agreed as it was reported by (AJER, 2015) that teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies in their teaching... by Bransford et al., (2000), several studies have reviewed the literature on ICT and learning and have concluded that ICT has great potential to

enhance teacher performance (Ramchandra and Kamble, 2014) and Kennah (2016), another study by Dawes, (2001) views that, new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have not been possible before.

Using ICT in teaching is also perceived as having the advantage of heightening motivation for learner; helping recall previous learning; providing new instructional stimuli; activating the learner's response; providing systematic and steady feedback; facilitating appropriate practice; sequencing learning appropriately; and providing a viable source of information for enhanced learning (Zhang and Ping et al., (2019).

Consider teaching respiratory system by using you tube with moving picture rather than traditional explanation. A teacher's job becomes simplified and the role becomes that of a facilitator. Research and active projects, such as those run by EdQual, a Research Consortium of educational institutions in the UK and Africa (Ghana, Rwanda, South Africa, Tanzania) on Educational Quality, typically indicate several reasons why teachers use ICT: teachers feel that their own use of computers benefits their learners, teachers feel learners benefit from using computers themselves, they gain confidence, self-esteem and renewed motivation.

5.2.2 Delivery of Educational Resources

From the findings in chapter 4 section 4.3.2, 93% of the respondents agreed that ICT has increased the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. ICT professional development for teachers

is a key in delivery of educational resources. ICT has improved the delivery of education and enable wider access to the same. In addition, it has increased flexibility so that learners can access the education regardless of time and geographical barriers. A study by Gillespie (2006) revealed that new technologies can be used to enable students to collect information and interact with resources, such as images and videos, and to encourage communication and collaboration among students.

Through ICT the delivery of education resources can be in the form of computer tutorials, simulation software, digital media such as CDs, DVDs and blue ray, video and audio cassettes, television and radio programmes. These electronic media can simplify concepts and enable the students to grasp the concepts in a shorter time than it could have been explained by the teacher.

Punie et al., (2006) states, by using ICT in teaching flexibility, personalization and different learning styles can be combined; and learning can be authentic, motivational and conceived as a social process enabling peer-to-peer informal interactions that lead them to learn from each other. Craft (2005) argues, digital technologies have great potential to enable creative processes.

Loveless (2007), holds that, creative learning activities need meaningful contexts and ICT can offer tools for creating such contexts. These tools can represent information in a variety of modes that enable learners to make changes, try out ideas and approaches to problem solving.

5.3 The Availability of Teachers' ICT In-service Training and Facilities to Assist Teaching and learning Process

5.3.1 Availability of Teachers' In-service Training

Noted earlier in chapter 4, the findings obtained through this study indicate the insufficient amount of In-service training given to teachers, it is through this when it is suggested that, more effort is required to be done by education stakeholders so as to implement and improve this in-service training for teaching and learning process modification where many things have changed due to the growth of science and technology in teaching (Gandhar and Seema, 2011).

5.3.2 Availability of ICT Technical Support

Based on the findings obtained from this study, it is suggested that in order to understand how computer technology is effectively used by teachers, it is essential to provide sufficient support from computer experts. ICT support in schools helps teachers to use it in teaching without losing time through solving software and hardware problems. According to Yilmaz (2011), it is significant to provide teachers with technical support concerning repair and maintenance to continue the use of ICT in schools.

Tong and Trinidad (2005), asserts that if there is no technical support for teachers, they will be disappointed to use ICT. Therefore, ICT support in schools helps teachers to use it in teaching without losing time through solving software and hardware problems get rid of the fear of equipment failure and that technical maintenance will be carried out regularly, resulting in less risk of technical breakdown.

5.3.3 Accessibility of ICT Facilities

This study suggests that, efficient and effective use of technology depends on the availability of hardware, software and the equity of access to resources by teachers. The results of the study as detailed in chapter 4, show unavailability and inaccessibility of ICT facilities and resources that hinders the use of ICT in teaching. It is also revealed that, teachers who had their own computers, computers labs and media rooms in their schools acknowledged that occasionally they were more likely to use them in instruction and lesson preparation than teachers who did not; furthermore, the study results disclose that, more than 50% of teachers who had computers in their schools used them for research and activities related to lesson preparation and teaching. Effective adoption and integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT resources such as hardware, software, to mention a few. Another study by Yildirim (2007) found that, access to technological resources is one of the effective ways to teachers' pedagogical use of ICT in teaching. Therefore, access to ICT facilities such as internet, CDs, updated software and hardware are key elements to successful adoption and integration of technology in teaching.

5.4 The Limitation of using ICT in Teaching and Learning Process

This section discusses the barriers that have been identified as the barrier to the use of ICT in teaching processes in secondary schools.

5.4.1 Teacher Competence and Confidence

In this study, 86% of respondents agreed that lack of training on the use of ICT in teaching as it influences teachers' competence and confidence, is a barrier in

integrating ICT in teaching. This study matches with the study done by Newhouse (2002), which reveals that many teachers lack the knowledge and skills to use computers and are not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. Another study by Pelgrum (2001), found that teachers' lack of technological competence is a main barrier to their acceptance and adoption of ICT.

Mukama and Anderson (2008) in their study reports that, using ICT to train teachers is most necessary as it leads teachers to change attitudes, be more technologically skilled, motivated to use the same technologies after training and enhance collaboration. The study concludes little or lack of professional training on how to use ICT in teaching is a major barrier. For successful integration of ICT in teaching an emphasis should be put in providing pedagogical training on using ICT as across the curriculum is important.

Therefore, teachers need knowledge of appropriate ICT integration approaches and ICT skills to successfully incorporate the ICT tools into their lessons. Training teachers on ICT related skills within the context of classroom objectives and activities ensures development of skills in integrated use of ICT in teaching.

5.4.2 Teachers Attitude Towards the Use of ICT to Facilitate Teaching

A lot of research on the attitude of both students and teachers towards the use of ICT in teaching and learning had been done with outcome being either positive or negative. For instance, BECTA (2004) reported that negative attitude was a barrier towards integration of ICT in teaching and learning while, Rhoda and Gerald (2000)

found that positive attitudes towards ICT use are widely recognized as a necessary condition for effective ICT use in teaching and learning. Similarly, Kubiak et al., (2009) in their study identified that attitude towards ICT determines its adoption in teaching. With this study teachers' attitude on ICT use is negative. If teachers' attitudes are positive toward the use of educational technology, then they can easily provide useful insight about the adoption and integration of ICT into teaching processes.

The attitudes of teachers towards technology greatly influence their adoption and integration of ICT into their teaching process, therefore an understanding of personal characteristics that influence teachers' adoption and integration of ICT into teaching is relevant. To successfully integrate ICT in teaching processes teachers are argued to change their attitude towards ICT specially to develop a positive attitude. It is advisable to adopt more appropriate measures to help both teachers and students further improve on their attitude towards ICT use in teaching and learning.

5.4.3 Limited Access to ICT Facilities

The study results show that 94% of the respondents agreed that unavailability and inaccessibility of ICT facilities and resources hinders the use of ICT to facilitate teaching, the study results indicate that accessibility and availability of ICT resources plays a huge role in determining the use ICT to facilitate teaching. To supplement these results an interview was conducted to the selected sample and the respondents gave their views regarding the barriers that hinders the use of ICT to facilitate teaching and learning most respondents argued that they do not use ICT

because they do not have access to ICT resources and some schools don't have facilities such as power, computer laboratory, internet access, and electronic projectors.

The study by Eze and Olusola (2013) revealed that in Botswana, lack of electricity in rural schools and high cost of computers is a stumbling block to the integration of ICT in teaching; internet is impossible where there are no telephones and electricity. The findings are similar to White (2018), Kivuli (2013) and Kiwonde (2018).

Kiwonde (2018), in her study conducted in Musoma District, it is revealed that, twenty-two (81%) out of twenty-seven teachers who were interviewed stated that in teaching and learning, one of the critical challenges they face is lack of ICT teaching and learning facilities. Effective application of ICT into classroom heavily relies on the availability of technological resources, qualified and confident teacher and other internal and external factors that directly or indirectly affect teachers' welfare and morale.

The study further shows that teachers have a positive perception on the use of ICT, but the availability and accessibility of ICT resources such as hardware, software and communication infrastructure are limited. If there are some ICT resources in a school, they are only limited to office use. Integrating ICT to teaching learning is not an option to the government and school owners, efforts should be made to ensure ICT infrastructures are available in all schools and are used as we are preparing children to live in a 21st century.

5.4.4 Lack of Technical Support

The study shows that 88% of the respondents indicated that they lack technical support on ICT issues hence they are intimidated to use ICT in teaching. Similar to this study, the study by Pelgrum (2001) found that, in the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance. Lewis (2003) asserted that without both good technical support in the classroom and whole school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT. Therefore, the use of ICT in teaching and learning can be improved with availability of ICT support staff in schools.

The interview conducted revealed that, breakdown of a computer causes interruptions and if there is lack of technical assistance, then it is likely that the regular repairs of the computer will not be carried out resulting in teachers not using computers in teaching. The effect is that teachers will be discouraged from using computers because of fear of equipment failure since no one would give them technical support in case there is a technical problem. BECTA (2004) agrees that if there is a lack of technical support in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns.

Therefore, if there is no technical support for teachers, they become frustrated resulting in their unwillingness to use ICT. ICT support in schools, influence teachers to apply ICT in classrooms without wasting time from troubleshooting hardware and software problems.

5.4.5 Teaching Experience

The study result shows that there is a digital divide (generation gap) between the teachers. Only 42% of the total teachers' population use ICT in teaching, 58% don't use at all. Younger teachers have emerged to be positive about using ICT to facilitate teaching than older teachers; the study indicates that for most of younger teachers apart from owning computers and tablets or smart phones, they occasionally engage in using software and mobile application and educational website in teaching as compared to senior teachers.

The study reveals that senior teachers indicated that their age and teaching experiences were the barriers to adapt to the ICT integration into their lessons. This results correlate to the study done by Mathayo, (2016) on Teachers' experience on ICT use to facilitate teaching in Ilala district secondary schools. Teachers with more experience in teaching did not prefer to use ICT tools in their classes. This is because the younger ones still have the concepts of the ICT training they had from their former colleges, but there is a need of teachers' in-service training or professional development in order to make them more competent and confident in using ICT for effective teaching process.

5.4.6 Professional Development

Insufficient amount of in-service training programs for teachers is another barrier that hinders the use of ICT in teaching, during the interview session respondents reported that there were no enough in-service training opportunities for teachers in the use of ICT in teaching, as found in chapter 4, section 4.4.1 and 4.5.5 only 4% of

the total 15363 population got training while the rest 96% of the respondents did not get in-service training on ICT.

Similar to the study by Mwalongo (2011), ‘the level of teachers’ competence in employing ICT in teaching and learning process was found to be influenced by computer training whose duration ranged from two weeks to six months’. A study by Newhouse (2002) states that, “teachers need to not only be ICT literate, but they also need to develop skills in integrating ICT use into their teaching and Learning”. According to Newhouse (2002), teachers need training in technology education (focusing on the study of technologies themselves) and educational technology (support for teaching in the classroom).

In responding to the interview one respondent said:

“I don’t use ICT to facilitate teaching and learning because I don’t know how to use ICT. The knowledge I have regarding using ICT is very basic to the extent that I lack confidence to use it in front of the students, but I do believe that through ICT my job as a teacher will be simplified and entertaining to my class. I think the school owners should organize seminars, workshops and short courses on how to integrate ICT in teaching processes. It is very important to introduce teachers and other education stakeholders to seminars and workshops on technology based teaching and learning”

Therefore, teachers’ in-service training on ICT is very important and is a solution of the barriers which hinders the use of ICT to facilitate teaching and learning namely; teacher’s attitudes toward use of ICT, lack of teacher training on the use of ICT to facilitate teaching and learning, unavailability of technical support staff, availability and accessibility of ICT resources and facilities.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter provides the last part of the research report; it covers conclusion and recommendations for actions and for further research.

6.2 Summary of the Findings

This study intended to examine the importance of teachers' In-service Training on ICT to go hand in hand with the advancement of science and technology in teaching and learning in secondary schools in Tanzania: A case of Bariadi district secondary schools.

The study was guided by three objectives:

To identify benefits of using ICT to facilitate teaching process in secondary schools, to examine the availability of teachers' ICT in-service training and facilities in teaching and learning process in secondary schools in Bariadi district and to explore the limitation of using ICT to facilitate teaching and learning process in secondary schools.

The study intended to address the following research questions:

What are the benefits of teachers' in service training on ICT in assisting teaching and learning process? What kind of teachers' ICT in-service training and facilities available in schools to assist teaching-learning? And what are the limitations of using ICT in teaching and learning process in secondary schools in Bariadi district?

The sample was selected from 20 different secondary schools, 5 ward educational offices, 3 ODL Teacher facilitators and 2 district educational offices located in Bariadi district in two councils. The respondents selected were expected to provide full information about the research topic. The sample size of 100 respondents was purposely and randomly selected to provide information regarding their experience on the use of ICT to facilitate teaching within their schools through the questionnaire.

Also interview guides were used to support information obtained through questionnaires and to increase reliability of the findings. The study employed descriptive survey research design. According to Smith, Thorpe, and Lowe (2002) the main purpose of a descriptive survey design is to obtain information from a defined set of people so as to generalize the sample results to the population. Gray, (2004) maintains that descriptive survey tends to use an inductive approach, often using open-ended questions to explore perspectives.

6.2.1 Benefits of ICT Use to Facilitate Teaching and Learning in Selected Schools in Bariadi

On examining the benefits of using ICT to facilitate teaching, the following were identified as the benefits of using ICT to facilitate teaching: - individualized interactivity, delivery of educational resources, access to global knowledge base facilitates integration with resources, simplify teachers work. The study indicates that using ICT in teaching has benefits to teachers. According to White (2018) several studies have reviewed the literature on ICT and learning and have concluded

that it has great potential to enhance student achievement and teacher learning. The study revealed that 92% of the population agreed that ICT has a lot of benefits in facilitating teaching and delivery of educational resources.

6.2.2 Availability of teachers' ICT in-service Training and facilities to Facilitate Teaching in Secondary Schools

On examining the availability of ICT in-service training for teachers and facilities used for teaching in secondary schools, the study identified the inadequate ICT in-service training for teachers and facilities in schools, inaccessibility of ICT facilities and lack of enough technical support in schools. Generally, there is unavailability of teachers' ICT in-service training in schools to assist teaching.

6.2.3 Limitations Hindering the Use of ICT in Teaching and Learning in Selected Secondary Schools in Bariadi District

Teachers' negative attitude, confidence and competence, unlimited access to ICT resources and facilities and lack of technical support, inadequate ICT infrastructure on ICT and lack of professional development were identified as the barriers hindering teachers to use ICT to facilitate teaching in secondary schools. From the findings about 92% of the population agreed that ICT has negative contributions in teaching. The limitations revealed from these findings seen to be minimized through teachers' professional development and ICT Infrastructure as well as facilities improvement in schools.

6.3 Implication of the Study

The findings of the study show that, teachers' in-service training is greatly needed on increasing teachers' effectiveness in performance. The results show that there is a

gender gap among teachers, according to the findings of the study male teachers show to frequently use ICT in teaching as compared to the female teachers, the study also identified a generation gap amongst teachers, junior teachers demonstrating much interest of learning how to and integrating ICT in teaching as compared to senior teachers, the study reveals that there is a digital divide-the gap between schools who have access to ICT facilities and those who do not, which makes a huge difference in the use of ICT in teaching among schools. The findings of the study also identify a direct relationship between level of education among teachers and their use of ICT to facilitate teaching, whereby teachers with first degree or higher have shown intentions and interest in using ICT to facilitate teaching as compared to diploma holders.

According to objective one of this study, the findings indicate that teachers are aware of benefits of using ICT in teaching. Teachers were able to identify the benefits of using ICT to facilitate teaching which are; - ICT make teaching job easier, ICT promote individualized interactivity, ICT improves delivery of educational resources, and ICT offers a wide access to global knowledge, ICT facilitate interaction with resources.

In the second objective of the study, the availability of ICT in-service training for teachers and facilities used for teaching in secondary schools, the study identified the inadequate ICT teachers' in-service training and facilities in schools, inaccessibility of ICT facilities and lack of enough technical support in schools.

The third objective of this study was to identify the limitations of ICT use in teaching and learning: Teachers' negative attitude, teachers' lack of confidence and

competence, unlimited access to ICT resources and facilities and lack of technical support, inadequate ICT infrastructure on ICT and lack of professional development were identified as the barriers hindering teachers to use ICT to facilitate teaching in secondary schools. Thus teachers' ICT in-service training is revealed to be one of the major solutions towards these limitations.

The major implication of this study is, teachers are aware of the benefits of using ICT in teaching and generally they support the use of ICT in teaching, however majority of the teachers prefer traditional way of teaching. According to the study findings, teachers do face barriers when using ICT in teaching and these barriers constrains them from using ICT in teaching. For the successful integration of ICT in teaching, the identified factors as determinants for the use of ICT in teaching must be given a serious consideration by ensuring the barriers are reduced or completely eliminated through;- increasing access to ICT facilities (computers, connectivity, software, rooms etc.), training teachers on how to use ICT in teaching, hire ICT technical support staff ,teachers to change their attitudes towards ICT use, provide pre service and in service trainings and seminars on how to integrate ICT in teaching, investing in ICT infrastructures and resources.

6.4 Conclusion

In line with the findings obtained, the following conclusions can be made:

The use of ICT in teaching processes has benefits to teachers and learners in the entire process of teaching and learning. The study concludes that the success of the integration of new technology into education varies from curriculum to curriculum, place to place, and class to class, depending on the ways in which it is applied.

The findings show that there is unavailability of teachers' in-service training on ICT and lack of enough technical support of ICT facilities in schools. With this study, it is therefore suggested that, provision of this ICT in-service training to teachers can solve other challenges of using ICT in teaching at schools.

Several studies have discovered that whether novice or skilful, CIT-related training programs develop teachers' capabilities in computer use. Teachers' understanding of content knowledge and how to apply technology to support students' learning and attainment are joined to their increase in knowledge level, confidence and attitudes towards technology. Educators who integrate technology with new teaching practices gained through professional training can transform the performance of the students.

Also, the barriers that hinder the use of ICT in teaching and learning can be eliminated through emphasizing teachers' professional development on ICT, ensuring availability and accessibility of ICT facilities in schools and technical support. Teachers' negative attitude, teachers' lack of confidence and competence, unlimited access to ICT resources and facilities and lack of technical support, inadequate ICT infrastructure on ICT and lack of professional development were identified as the barriers hindering teachers to use ICT to facilitate teaching in secondary schools.

The limitations revealed from these findings seem to be minimized through teachers' professional development and ICT Infrastructure as well as facilities improvement in schools.

6.5 Recommendation

For immediate effect, the study recommends that, teachers should be trained on how to use ICT in teaching, teachers should develop positive attitude towards ICT. The study also recommends that schools authorities should empower teachers by facilitating ICT in-service training, provide enough ICT facilities. The Ministry of Education Science and Technology has to provide more funds to establish at least minimum ICT facilities to enable the schools to attain infrastructures for teaching.

This study would like to provide some views on the importance of teachers' in-service training and how the program can be developed. Teachers' in-service training in Tanzanian secondary schools can be implemented because there is the availability of training organizations and the presence of many opportunities of resources.

For further research study, therefore, further studies are still needed to investigate the ways that the trainings can be implemented, more often amendments are needed to be made in Tanzania education policy in order to accommodate necessary changes from the study findings. For this case there is a need of future research to explore the specific areas of the curriculum to be addressed for the amendment in order to make provision of in-service training or professional development more often.

The government should find and allocate sufficient funds to the Ministry of Education, Science and Technology in order to equip teachers with in-service trainings. In order to make the improvement of teachers' in-service training on ICT,

government support is inevitable for provision of fund and other incentives through stakeholders to implement the trainings for high teaching and students' performance. So, further studies are required to investigate if there are sufficient funds to sponsor this area of the study. Moreover, this research study has been conducted in one district where the researcher was familiar with, leaving other parts of Tanzania; therefore, further studies are required to be conducted in the other parts of Tanzania.

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APPENDICES

Appendix I: Budget

The following is an estimated budget, which shows the amount of money required for conduct field research over a period of six months.

S/N	ITEMS	DESCRIPTION OF ITEMS	TOTAL (T SHS.)
1	Travelling Cost	80,000	80,000
2	Meals and Accommodation costs	6000x60	360,000
3	Stationery	40,000	40,000
4	Printing	50,000	50,000
5	Binding	30,000	30,000
6	Expenses	100,000	100,000
	TOTAL		660,000

Appendix II: Questionnaire for Teachers and Students

Objective:

The questionnaire intends to collect information on the use of ICT to facilitate the teaching process in Secondary Schools. This is purely an academic work conducted in partial fulfilment of Master's Degree in Education, Administration, Planning and Policy Studies (MEDAPPS)

All answers in this work remain as a confidential

Questions: -

1 Please enter the name of your institution

2 Tick your sex

i. Male ()

ii. Female ()

3. What is your age?

Tick one box only

30 or less

31-35

36-45

46-55

4. Tick your educational level

i. Certificate ()

ii. Diploma ()

iii. Bachelor ()

iv. Postgraduate ()

5. For how many years have you been teaching in secondary schools? *Numeric characters only. Use decimal point (.) and not comma if necessary.*

6. Do you have your own computer in an office at the institution?

Yes, a desktop computer

Yes, a laptop computer

Yes, both of them

No

7. What best describes your level of technology expertise? (Tick)

I'm very uncomfortable using technology at home

I'm fairly uncomfortable using technology at home

I'm fairly comfortable using technology at home

I'm very comfortable using technology at home

8. Does the School have computer laboratory?

Yes

No

9. Does the School provide Internet access to the students and teachers?

Yes

No

10. Have you ever used ICT in your classroom?

i. Yes ()

ii. No ()

11. If Yes. What motivated you to integrate your lesson with ICT?

i. _____

12. If No. why?

i. _____

ii. _____

13. Do you think using ICT in classroom teaching has benefit to both students and the teacher?

i. Yes () ii. No ()

14. If Yes, elaborate how

15. Do you think the use the ICT during lessons has the following benefits on both teachers and students?

	Strongly Agree	Agree	Disagree	Strongly Disagree
Facilitate and make learning easier				
Individualized interactivity				
Delivery of educational resources				
Access to global knowledge base				
Facilitate interaction with resources				

16. Do you think the following suggested barriers hinder the use of ICT in classroom teaching?

	Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
The availability and accessibility of ICT facilities and resources					
Teachers' altitude towards ICT use					
Teachers' ICT competence and confidence					
Teacher' In-service Training on ICT(Professional Development)					
Availability of technical support					

17. Do you think the following practices may enhance the use of ICT in Classroom teaching?

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
Positive attitude and confidence towards ICT Use					
Competence in ICT use Professional development					
Availability of technical support					
Availability and accessibility of ICT facilities					

Appendix III: Interview Guides to Teachers and Education Stakeholders

Objective: -

The Interview guides intend to collect information on the use of ICT to facilitate the teaching process in Secondary Schools. This is purely an academic work conducted in partial fulfilment of Master's Degree in Education, Administration, Planning and Policy Studies (MEDAPPS)

All answers in this work remain as a confidential

1. What are the benefits of using ICT in secondary school teaching?
2. What are the barriers of using ICT in secondary school teaching?
3. In which ways can we improve the use of ICT in secondary schools?

Appendix IV: Permission Letter for Data Collection

Jamhuri ya Muungano wa Tanzania
OFISI YA WAZIRI MKUU
TAWALA ZA MIKOA NA SERIKALI ZA MITAA

Anwani ya Simu: "ADMIN"
Simu Na. 028 – 2700020:
Fax. Na. 028 - 2700553:

Ofisi ya Mkuu wa Wilaya,
S.L.P. 1,
BARIADI.



Unapojibu tafadhali taja:

Kumb. Na. AB. 26.214/01 "A"/16

11 Septemba , 2019

Mkurugenzi wa Mji,
BARIADI.
Mkurugenzi Mtendaji (W),
BARIADI.

YAH: KUMTAMBULISHA NDG. MARO M. MSAMI


Husika na mada tajwa hapo juu.

Napenda kumtambulisha kwako mtajwa hapo juu ambaye ni Mwanafunzi wa Chuo Kikuu Huria cha Tanzania mwenye lengo la kufanya utafiti ikiwa ni sehemu ya masomo yake.

Utafiti huo una kichwa cha habari "**Teacher's Inservice Training on ICT Prospects and Challenges in Bariadi District Council and Bariadi Town Council**" ambao utafanyika kwenye shule za Sekondari zilizopo Wilayani Bariadi.

Kibali kwa ajili ya utafiti huo kimetolewa, hivyo namleta kwako uweze kumtambulisha kwa wakuu wa shule ili aweze kukamilisha malengo yake.

Ninashukuru kwa ushirikiano wako.



Veronica S. Kinyemi

**KATIBU TAWALA WILAYA
BARIADI**

**KATIBU TAWALA WILAYA [W]
BARIADI**

Ant-Plagiarism Check Report

Name	Ant-plagiarism (%)
OMARI RAJABU IDD	25%
MARO MTATIRO MSAMI	22%

<input type="checkbox"/>	Omari Rajabu Idd	INFLUENCE OF TEACHERS' MOTIVATION ON STU...	25% 		•		1365850684
<input type="checkbox"/>	Maro Mtatiro Msami	TEACHER'S IN-SERVICE TRAINING ON ICT. PR...	22% 		•		1365850090