THE CHALLENGES OF TECHNOLOGY USE IN EFFECTIVE TEACHING AND LEARNING IN SECONDARY SCHOOL STUDENTS IN TANZANIA

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CERTIFICATION

The undersigned certify that, we have read and hereby recommend for acceptance by the Open University of Tanzania on a dissertation entitled; ***The Challenges of Technology use in Effective Teaching and Learning in Secondary School Students in Tanzania: A Case of Arusha Municipality,*** in partial fulfillment of the requirements for the award of Masters of Education in Administration, Planning and Policy Studies (Med-Apps) Post Graduate Degree of the Open University of Tanzania (Arusha center).

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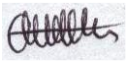
DECLARATION

I **Raphael Chelula**, declare that the, work presented in this dissertation is original work. It has never been presented to any other University or Institution, where other people's works have been used, references have been provided. It is in regard that I declare this work as originally mine. It is hereby presented in partial fulfilment of the requirement for the Award of Masters of Education in Administration, Planning and Policy Studies (Med-Apps) Post Graduate Degree of the Open University of Tanzania (Arusha center).



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Signature

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Date

DEDICATION

This work is dedicated to my lovely Parents Mr and Mrs chelula for their material and financial support they provided to me during my studies. They are the main source of my success in my education.

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I heartily convey my sincerely gratitude to God whose protection and guidance enabled me to accomplish my research work. They never sat on the fence; they always assisted me as more as they could with all of their efforts until the accomplishment of my research work.

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ABSTRACT

The main objective of this study was to assess the challenges of technology use in effective teaching and learning in secondary school in Tanzania. The Study was guided by the following Objectives were to; assess the type of challenges of technology use for effective teaching and learning in secondary school in Tanzania, investigate the impacts of technology use to effective teaching and learning in secondary school in Tanzania and identify possible measures that can be used handle the type of challenges of technology use in effective teaching and learning in secondary school in Tanzania. The study adopted a mixed research approach and a partial mixed concurrent dominant status design; this was the design. The study used a total sample size of 255 respondents. The study gathered data through interviews and questionnaires to explore challenges and impacts of technology use in secondary school teaching and learning. Key findings indicated that teachers often lack essential skills and knowledge for effectively integrating ICT in their instruction, with challenges linked to inadequate ICT facilities and expertise. However, the use of technology was found to enhance student knowledge, reduce dependency on teacher quality, make education accessible at home, promote practical learning, and facilitate quicker academic feedback. To address these challenges, the study proposed several measures, including improving school infrastructure, renovating classrooms, ensuring reliable electricity, prioritizing the provision of ICT facilities, and implementing teacher training programs. Additionally, it recommended that the government emphasize the necessity of ICT in education, initiate ICT training from primary school, and standardize training materials through the Ministry of Education to unify teacher training efforts.

Keywords: *Technology, Teaching, Learning, Secondary School, Students*

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LIST OF ABBREVIATIONS

HoS	Head of School
ICT	Information and Communication Technology
MoEC	Ministry of Education and Culture
MoEVT	Ministry of Education and Vocational Training
TAM	Technology Acceptance Model
UNESCO	United Nations Educational, Scientific and Cultural Organization
URT	United Republic of Tanzania

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE PROBLEM

1.1 Introduction

The integration of technology into educational settings has transformed teaching and learning dynamics globally, offering unprecedented opportunities for enhancing student engagement and access to information. However, in Tanzania's secondary schools, the adoption of technological tools faces significant hurdles that impede effective instructional practices. These challenges range from inadequate infrastructure, such as unreliable internet connectivity and insufficient access to devices, to a lack of training and support for teachers in utilizing technology effectively (HakiElimu, 2019).. Additionally, cultural attitudes towards technology and disparities between urban and rural schools further complicate the integration process, leading to significant inequities in educational experiences and outcomes (Mwasamajengo, 2022).

Given these obstacles, there is an urgent need to explore the challenges associated with technology use in Tanzania's secondary schools. Understanding these barriers will not only shed light on the current state of educational technology implementation but also inform policymakers, educators, and stakeholders on potential strategies for improvement. By conducting this study, we aim to identify the specific difficulties faced by teachers and students in harnessing technology for teaching and learning, thus paving the way for evidence-based interventions that promote equitable and effective educational practices in the country. This chapter provides an overview of the problem that was investigated. It comprises of

background to the problem, statement of the problem, research questions, objectives of the study, and significance of the study, conceptual framework, scope of study, limitation and delimitation of the study structure and content.

1.2 Background of the Problem

Teaching is a demanding profession in today's rapidly evolving society, where the use of Information and Communication Technology is essential for effectively navigating the vast amount of knowledge available. ICT has quickly become a fundamental aspect of education in modern society.

UNESCO (2002) emphasizes the importance for countries to prioritize the incorporation of ICT education into their core curriculums, as understanding and mastering basic concepts are now essential skills for students. Tanzania's government has mandated the integration of technological tools in the education system, emphasizing the importance of ICT knowledge as a fundamental aspect of learning. Experts believe that as technology continues to advance, proficiency in digital skills will become essential for success in various aspects of life.

According to the National Council for Curriculum and Assessment, UK (2004), as technology advances at a rapid pace, students today will need to be proficient in using technology as it becomes increasingly integrated into their daily routines.

In china it show that, China has made less investment towards the integration of ICT in school management the same way it has in teaching and learning (Liu, Huang & Lalic, 2020). However, under the shadow of ICT integrations in teaching and learning, there have been witnessed some drastic changes among school principals in the aspect of practicing ICT-based institution management. Many principals are

skilled in using digital tools and software which is a significant improvement towards digital school management practices especially in managing teaching and learning aspects (Liu, Huang & Lalic, 2020).

Advocates of technology in education have been promoting its transformative potential since the 1970s. By the late 1980s, there was a shift towards integrating computers into the curriculum, focusing on developing students' skills to effectively utilize technology (Lockard & Abrams, 2012).

There is a growing push to incorporate technology into education, driven not only by education departments but also by parents and the business community. The Internet, a key aspect of the digital age, is playing a significant role in this shift. Hargittai (2013) explains the Internet as a vast network connecting computers and people worldwide.

Governements have also acknowledged the importance of technology in driving national development, particularly in modernizing and globalizing the economy. As a result, various initiatives have been launched to promote the development and use of ICT.

Although governments across Africa are striving to overcome challenges facing ICT integration in education, Heads of Schools' perception is a critical issue to understand the degree of ICT use at the school level. In Nigeria, there is an effective use of ICT in secondary schools due to positive perceptions of Heads of Schools on ICT (Nsi-maku, 2015). Heads of Schools in Nigeria favour the use of ICT in teaching and learning as it inspires students improves their interest, boosts their self-esteem and confidence. ICT enhances students' imagination, encourages greater

interactivity, critical thinking, and it increases their achievements. Furthermore, Nsi-maku asserted that ICT use faces a lot of challenges such as costs for procurement and inadequate or incomplete software, limited support infrastructure and shortage of qualified manpower. But due to Heads of Schools' perception of ICT; encourages schools to use those scarce ICT facilities to optimize ICT usability in schools.

In Sudan Khartoum, integration of technology in education management to promote effective teaching and learning has been experiencing different pitfalls because very few schools implement ICT policies due to a wide range of barriers like lack of enough ICT facilities and equipment. Therefore, there is the need for the governing bodies and development partners to join efforts to ensure that schools are provided with the requirements for successful ICT policy implementation (Ahmed, 2015).

Comparably, in Tanzania, the application of technology in an efficient teaching and learning process has not advanced to a great degree because of a number of issues, including a lack of trained personnel, remote locations that do not support the use of technology, inadequate supplies for schools, and too many other issues to list. In Tanzania, the ICT business has grown rapidly in the previous ten years due to the application of ICT. The Ministry of Science, Technology, and Education has placed a strong emphasis on the use of technology in the teaching and learning process in order to provide students with the necessary information to function in the modern world..

The effort to integrate ICT in teaching and learning was done through introducing ICT policy of 2017.The policy was prepared to incorporate ICT in pre-primary, primary, secondary, and teacher education, as well as adult education and informal

education. ICT for basic education was governed by the overarching goals of education policies as well as National development policies such as Tanzania's 2003 and 2016 National ICT Policies (MoEVT, 2007). Tanzania recognizes that ICT provides potential to improve education and the quality of education delivery in all sectors.

Despite various efforts to integrate technology in secondary schools, still, there are many challenges facing technology use in secondary schools and some of those challenges are highlighted in ICT policy for basic education. In fact, there are many secondary schools in Tanzania not yet incorporated with technology use for teaching and learning despite the availability of ICT facilities in schools (HakiElimu, 2019).

1.3 Statement of the Problem

Tanzania's ICT strategy of 2016 is one initiative that intends to accelerate socio-economic development and has the potential to turn Tanzania into a middle-income economy and society driven by ICT (URT, 2016). Tanzania Development Vision 2025 served as a guide for the formulation of the policy within the framework of national vision declarations. It acknowledges that ICT is essential to a competitive social and economic transformation, necessitating investments in technology to raise the standard of science-based education and build a society that is knowledge-based overall (URT, 2016).

In Tanzanian secondary schools, there are still obstacles and gaps in the integration of ICT in the teaching and learning process, despite the existence of many ICT policies and government initiatives. Indeed, a lot of educational establishments lack

the bandwidth and ICT resources necessary to fulfill current demands (Mwasamajengo, 2022).

The most crucial question to ask is, "Why do teachers still have some difficulty implementing the use of technological facilities (ICT) in the classroom, despite the available initiatives?" Finding the correct response to the query could be challenging, but a plausible reason could be linked to a number of issues, such as inadequate computer proficiency, unfavorable attitudes toward ICT, and inadequate infrastructure (Ndibalema, 2014). Similar to these findings, Kayombo (2016) discovered a number of gaps between ICT policy and actual practice or execution of ICT goals in education.

The majority of schools lack electricity and ICT infrastructure, and teachers are not well-versed in ICT integration. These are just a few of the gaps. This may also indicate that the use of ICT in secondary education is not likely to be beneficial. Even nevertheless, the majority of teachers neglect to use computers for anything but creating lesson plans and imparting general computer expertise. Additional explanations could have to do with the ICT framework for teachers, which is deficient in ways to adequately train teachers to incorporate ICT into teaching and learning. While the methods for adoption are not clearly defined, what is seen is merely a list of ICT abilities that a teacher should acquire. Despite its existence, the framework admits the shortcomings of the current digital content and systems (URT, 2015). Even the curriculum doesn't seem to include using ICT specifically to meet learning objectives. Because of this, methods for encouraging secondary school teachers to utilize ICT are still unknown.

ICT integration in education has drawn interest and attention from a wide range of individuals in Tanzania (Bukaliya, 2012). ICT is being incorporated into education in many rich and developing nations, however Tanzanian secondary schools are trailing behind, according to Ngeze (2017). The current state of inadequate resources and infrastructure has led to a gradual implementation of computer studies in urban schools, albeit it is unclear to what degree (HakiElimu, 2019). The best way for teachers to incorporate technology into their lessons is still up for debate, as recent graduates are not well-versed in the subject. Therefore, the purpose of this study is to assess the challenges of technological use on teaching and learning to secondary schools

1.4 Main Objective of the Study

The main objective of this study was to investigate the challenges of technology use in effective teaching and learning in secondary school, Tanzania.

1.5 Specific Objectives

The study was guided by the following Objectives;

1. To assess the type of challenges of technology, use for effective teaching and learning in secondary school in Tanzania.
2. To investigate the impacts of technology, use to effective teaching and learning in secondary school in Tanzania.
3. To identify possible measures that can be used to handle the type of challenges of technology use in effective teaching and learning in secondary school in Tanzania.

1.6 Research Questions

1. What are the types of challenges of technology use in effective teaching and learning in secondary school in Tanzania?
2. What are the impacts of technology use in effective teaching and learning in secondary school in Tanzania?
3. What are the possible measures that can be used to handle the type of challenges of technology use in effective teaching and learning in secondary school in Tanzania?

1.7 Significance of the Study

In particular, the study intends to look into the difficulties associated with using technology in Tanzanian secondary schools, particularly in the municipality of Arusha, for lessons and learning. The outcomes of this research offered a thorough explanation of the potential and difficulties associated with incorporating ICTs into secondary education in the Arusha municipality.

In addition, the study's findings have added to our understanding of how educators and students view ICT integration as well as how they use basic ICT tools like computers for general use, projectors, tablets, audiovisuals, and other educational technology.

The study helped to further research on the difficulties associated with integrating ICTs into the delivery of education in order to support students' academic achievement. The study has indicated topics that warrant additional investigation about the use of ICTs in education. With the goal of eradicating technological use

difficulties in schools and advancing the teaching and learning process, the study intends to awaken the Ministry of Education and other stakeholders in education.

By offering suggestions that policy makers might take into account while drafting and implementing policies, this study seeks to advance policy maker expertise. Additionally, it has produced suggestions for enhancing the methods used by educators as well as for additional study in the field of ICT integration in the classroom.

Not only may the study findings be shared with other academics and students at Open University, particularly those in the education area who are interested in exploring ICT use in education, but they also add to the body of literature about ICT and education. Not to mention, the results will advance our understanding of ICT in education and perhaps spur more study.

1.8 Limitations of the Study

There were several restrictions during the data collection process that had an impact on the data's quality in one way or another. Aside from the researcher outlining all research ethics, several participants felt uncomfortable being videotaped throughout the interview. Additionally, because some of the documents were private, the researcher was not allowed to access them during the documentary examination. In order to overcome these constraints and preserve the quality of the data, the researcher used triangulation in the data collecting process. Rather than recording voice and taking pictures with cameras, the researcher took notes in a notebook during the interviews.

1.9 Delimitation of the Study

This study was conducted in Arusha Municipality. The study focused on investigating the challenges of technology use in effective teaching and learning in secondary school, Tanzania. This study was confined to only teachers, head of schools, and students in Arusha Municipality, Tanzania. The study used mixed method approach to investigate the phenomena based on research objectives.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents literature related to challenges of technology use in effective teaching and learning. The reviewed literature enriched the understanding of the research problem. Specifically, the chapter presents the theory that guides the study, challenges of technology, use for effective teaching and learning, the impacts of technology use to effective teaching and learning and measures that can be used to handle the challenges of technology use in effective teaching and learning in secondary school in Tanzania. Furthermore, it presented empirical studies and established the research knowledge gap.

This section covers related literature on, the theory as well as reviewing empirical studies globally, in African context, in Tanzania as well as synthesis and the research gap.

2.2 Theoretical Literature Review

This study employed the Technology Acceptance Model (TAM) by Davis (1989) and to be useful to give an in-depth description of the school management views on the integration of technology in teaching and learning.

Technology Acceptance Model (TAM)

TAM is a theory of information systems that explains how technology is adopted and used by individuals. The actual use of the system is the end-point that technology is accessed by individuals. Behavioural intention is a consideration that encourages individuals to access the technology. The behavioural intention is informed by the

attitude that is the overall impression of technology (Davis, 1989). According to Davis (1989), this theory assumes that when a new technology is introduced to users, a variety of considerations impact their decision about how and when they can use it, notably:

i. ***Perceived usefulness (PU)***: This refers to the degree to which an individual believes that utilizing a specific system would improve their productivity at work, as stated by Davis (1989). Students are more likely to have a favorable opinion of utilizing ICT in the classroom if members of the school administration teams believe it to be beneficial.

ii. ***Perceived-ease-of-use (PEOU)***: According to Davis (1989), this is the degree to which a person believes using a particular system won't need any effort on their part. The difficulties are resolved if the technology is user-friendly. If something is difficult to use and complex, nobody feels good about it

iii. ***Attitude toward use***: The way a person feels about using a certain system is determined by how they analyze how easy they think it is to use, how it works, how their perspective changes depending on the situation (Davis, 1989).

iv. ***External variables***: It shows the challenges one faces while introducing new technologies into their existing teaching and learning procedures. Some examples of these characteristics are inadequate network affordability and connectivity, schools with inadequate ICT resources, insufficient time, inadequate training, and insufficient teacher competency (Davis, 1989).

TAM theory was relevant and found to be useful to this study as it explains various variables connected to the research objectives of the study. This is because the more teachers perceived usefulness and perceived-ease-of-use of ICT the more they contributed in influencing integration of teaching and learning. Moreover, they are attitude contributed toward integration of ICT. In addition, external variables according to Devis (1989) illustrate challenges facing integrating ICT in teaching and learning where teachers and school find strategies to overcome difficulties in integrating ICT use in teaching and learning. Moreover teachers when perceive that the using ICT was easy to use they had positive and develop a behavior to use in teaching and learning managing and they were in position to find out coping measures to handle the types of challenges that face teachers during using ICT purposely in teaching and learning.

2.3 Integration of ICT in Teaching and Learning

In order to prepare and deliver lessons, maintain student records, process assessments, and oversee teaching and learning activities, instructors can utilize digital technology as a pedagogical tool. However, more integration and development of this technology are needed (Manyengo, 2021). A small number of metropolitan primary and secondary schools, both public and private, as well as technical secondary schools, are equipped with desktop and laptop computers, calculators, phones, printers, scanners, and video cameras. These schools are primarily private. Teachers' and students' opinions of ICT in the classroom were favorable, according to Cherwa (2015).

However, a number of variables, like the interests, expertise, and experience of individual teachers, school policies, and internet connectivity, affect how these devices are used for teaching. In some public schools, digital resources are primarily acquired through projects or from organizations or individuals. In other schools with access to such resources, teachers are required to use them, at least for basic tasks like using word processing to prepare exams (Manyengo, 2021). Many secondary schools in Tanzania not yet incorporated with technology use for teaching and learning despite the availability of ICT facilities in schools (HakiElimu, 2019, URT, 2016).

2.4 Challenges of Technology Use for Effective Teaching and Learning

Italian researchers Mura and Diamantine (2014) looked into how instructors in elementary and secondary schools use, view, and communicate the use of ICTs in the classroom. The study examined variations in the ways that teachers integrated ICTs, as well as their viewpoints on how students used ICTs and the issues related to student ICT usage. 796 educators from all throughout Italy answered three sections of an online questionnaire that evaluated their knowledge of ICT, their opinions about ICT use in the classroom, and their perceptions of the hazards related to ICT use. The study discovered both highly and poorly skilled teachers when it came to integrating ICT into the teaching and learning process. Teachers also discussed the pervasive issues, such cyberbullying and internet addiction, that arise from pupils' use of ICT.

From Greece, Nikolopoulou and Gialamas (2016), investigated high school teachers' perceptions of barriers of using ICT in class. They used a quantitative research

design in which 119 randomly chosen high school teachers completed questionnaires to provide data. A large number of pupils in the class, little funding, and poor internet access were all identified as major barriers to the use of ICT in teaching and learning. Furthermore, compared to math and science instructors, it was found that female teachers and literature teachers received less support when it came to using ICT. In comparison to male instructors, female teachers' main obstacle to using ICT was found to be a lack of confidence in technology.

Daudi and Nzilamo (2019) examined the perceptions and practices of students concerning the use of ICT in teaching and learning in public secondary schools in Ilala municipality in Tanzania. Thirty randomly chosen and purposefully selected students participated in focus groups and completed questionnaires as part of a case study design that combined quantitative and qualitative research methods. The study's conclusions showed that students' opinions on ICT integration in the classroom were favorable. Additionally, the kids demonstrated their proficiency with a range of ICT tools. They asserted, meanwhile, that computers were not given enough time to operate ICT equipment. Students also stated that they could not bring their ICT equipment to class and that they could only utilize ICT in computer classes, not other subjects.

However, employing ICT resources for teaching and learning might present obstacles. While some schools have the ICT infrastructures needed to improve teaching and learning, those infrastructures are not employed in teaching and learning but rather to run other school activities, such as teachers' personal use (Ngeze, 2017). Moreover, ICT technology like as television, radio, smartphones,

computers, video, internet, projectors, and other equipped services like radio broadcasts on one channel or another can help with teaching and learning in schools (MoEVT, 2007).

2.5 The Impacts of Technology Use to Effective Teaching and Learning

The successful introduction of computer studies in secondary schools across the globe and its effective instruction raise yet another key mystery: what major factors could affect its effectiveness? (Pelgrum, 2011). It has been noted that a good deal of variables, when properly managed, contribute to the seamless, efficient, and engaging nature of computer-based instruction.

In Indonesia, Pardede (2020) researched on EFL secondary school students' perception of ICT use in EFL classrooms by employing the quantitative research approach whereby questionnaires were used to collect data from 197 participants who were randomly selected from 15 secondary schools located in Bekasi, Jakarta, and Depok. Findings revealed that the participants' perceptions of ICT usage in learning were favourable and high in certain aspects and poor in others. Some aspects that led to participants having a positive perception of ICT usage included; the potential for ICT usage to improve learning interest in the subject; the benefits of ICT use in learning; ICT leads to achieving educational objectives; and that ICT use leads to student self-efficacy. It was also discovered that the participants utilized ICT for amusement and social and economic goals rather than for educational purposes

Mwalongo (2011), conducted research on Teachers' perceptions of ICTs for teaching, professional development, administration and personal use, in Tanzania. The study employed a mixed method research approach, where 74 teachers were

involved in this study. Quantitative data was gathered using online Survey Monkey while qualitative data was downloaded from researchers' blogs and read word for word, and analysed using Weft QDA where research related themes were analysed. Quantitative data from Survey Monkey was analysed online in the form of percentages. The findings have shown that ICT use has been affected by availability, training, skills and competencies of ICT usage; teachers used ICT for classroom instruction, administration, and professional development and self-use in a wide range. Teachers did not, however, use ICT to change their pedagogical strategies radically, but instead to maintain their old traditions of teaching and learning activities.

2.6 Measures Used to Handle the Type of Challenges of Technology Use in Effective Teaching and Learning

Effective school leadership, innovative learning design, improved pedagogy integration, socially engaged instruction, collaborative participation, and group work are all necessary for the successful integration of ICT into the classroom (UNESCO, 2018). In addition, Heads of School must possess the following abilities: forming staff teams with members who have different skill sets and competences; creating ICT school policies; organizing staff training programs; strengthening partnerships and collaborations; and studying other schools that have successfully integrated ICT (Muhammad, 2019).

Heads of Schools are taking a variety of steps to aid in strengthening ICT in schools, including applying for government grants, prioritizing the procurement of ICT facilities and seeking ICT grants from NGOs (Oluoch, 2016). Other steps include

organizing ICT seminars and training staff about the significance of ICT in the classroom and using the support of parents to purchase ICT devices. Ngeze (2017) asserted that, although most of the schools do not have ICT facilities, and in schools where ICT is made available, the student-computer ratio is very high; teachers in schools (77.0 percent) already have either a laptop or a smartphone, or both. ICT equipment held by private individuals may be utilized by teachers for instructional purposes, according to Nzege (2017). That indicates that even though secondary schools lack ICT, one way to integrate ICT use for teaching and learning in the classroom could be to use teacher-owned ICT facilities

To implement ICT usage in schools, Heads of School as transformational leaders must set strategies, encourage their teachers, and help students on the ICT use in their schools. As school administrators, thus, Heads of School are important people who must use their powers to transform school circumstances and encourage teachers to engage in emerging ICTs to be used in school activities (Seyal, 2015). Heads of Schools' skills in implementing ICT in schools include promoting a collective atmosphere of agreed organizational goals; a shared vision and mission; developing positive school culture and thus offering resources for the professional advancement of teachers on ICT use, transmitting success expectations; improving engagement in school decisions; and providing fitting examples and individual or personal assistance(Adu & Olatundun, 2013; Leng, 2017; Seyal, 2015).

Heads of Schools have a considerable duty to initiate and introduce school reform through ICT which will promote critical choices to implement it into the teaching and learning. Heads of Schools must recognize, encourage and enforce the idea that

ICT integration is not about technology; it is about reflecting on future generations and guiding teachers to a transformation in pedagogy (Leng, 2017). Heads of School are in the role of leadership and portray the ability to institute conditions for the application of ICT in schools, and if they become more involved during innovations, their impact will be greater. Good leadership will certainly bring about improvements in decision-making that will affect the mechanisms of ICT adoption in classrooms. One of the paramount skills that Heads of School should possess so as to influence the ICT use in schools is to be transformational and supportive leaders. (Leng, 2017).

Competencies are among the strategies that assist ICT deployment in the teaching and learning process in one way or another. According to Rogers (2003), Heads of Schools who lack ICT knowledge and skills have a significant level of doubt, which may impact their perceptions of ICT use in the classroom (Rogers, 2003). To be able to lead teachers in bringing about meaningful change, Heads of Schools must be competent around organizational plans and development, curriculum instruction, assessment, and teachers' training on ICT use in the classroom. Heads of Schools must be encouraged to switch from old teaching techniques to the contemporary practice of using ICT. Consequently, Heads of Schools must be encouraged to create favourable perceptions of the ICT usage in the classroom, and that the execution process should be done skilfully and progressively to accept ICT implementation in schools.

2.7 Empirical studies

This section presents the empirical literature reviewed empirically in different countries including Tanzania as shown below

2.7.1 Empirical studies done in other countries outside Tanzania

Wijayasundara (2020) conducted a study in Sri Lanka on “Integration of ICT in teaching and learning in schools” using a quantitative approach with survey design. Data were gathered through a questionnaire and analyzed using content analysis. The results demonstrated that the majority of both students and teachers appreciated ICT-integrated education. Additionally, the findings highlighted that there are more positive outcomes associated with the integration of ICT in the teaching and learning process compared to any negative impacts. Moreover, the study identified several key challenges that impede the incorporation of ICT in education across various countries, including insufficient training, inadequate infrastructure, and a lack of funding for e-education, among others.

Ntorukiri et al. (2021) conducted a study on “Perceptions of teachers on use of ICT infrastructure in teaching and learning in secondary schools in Meru County, Kenya.” The study utilized a qualitative methodology and a descriptive survey research design, incorporating questionnaires, interviews, and observations to gather data from 276 participants, including 12 principals, 48 teachers, and 216 Form 3 students. The results suggest that teachers believe that integrating ICT into the teaching-learning process improves efficiency, quality, and accessibility. However, this research was conducted in Kenya and specifically examined teachers' perceptions of ICT infrastructure use in secondary education. Concentrating solely

on teachers' views regarding successful ICT integration does not provide a comprehensive understanding of the issue. Therefore, it is essential to also consider the challenges associated with ICT integration in teaching and learning in government secondary schools.

Yuen et al. (2021) conducted a study in Hong Kong China about ICT application in teacher development and teaching practice. This study focused on six high-impact journals in the field of teaching and teacher education, as identified in the 2019 journal citation reports. Its objective was to fill a gap in the literature by examining two main themes: the role of information and communication technology (ICT) in teachers' professional development (TPD) and its use in teaching practices. A total of 85 articles related to ICT applications, published between 2013 and 2019, were reviewed. The analysis highlighted key aspects of these ICT applications, including their functionalities, their impact on teaching and teacher development, the factors that influence their implementation, and the challenges present in current applications.

2.7.2 Empirical studies from Tanzania

Kweka and Ndibalema (2018) conducted a study in Tanzania on “Constraints hindering adoption of ICT in government secondary schools in Tanzania: The case of Hanang district” using mixed method approach and a cross-section research design. Data were collected using questionnaire and interview from 75 government secondary schools teachers, 15 heads of schools (HoS), 1 District Secondary Educational Officers (DSEO) and 3 quality assurers. Content analysis was used to analyse qualitative data whereas SPSS version 21 was used to analyse quantitative

data. The findings revealed that, most of the secondary school teachers had minimal skills of integrating ICT in teaching and learning due to various challenges like inadequate computer labs in schools, inadequate pre-service and in-service teachers training and lack of adequate ICT facilities in schools. Nonetheless, this study was conducted in Hanang district using a mixed method approach.

The study conducted by Mwila (2018), addresses the attitudes of secondary school teachers toward the integration of ICT in the teaching process in the Kilimanjaro region in Tanzania. A cross-section survey design was employed. The sample included one hundred (100) teachers from ten (10) secondary schools, utilizing interview schedules and questionnaires for data collection. The data were analyzed through descriptive and inferential statistics. The findings revealed that both male and female teachers held favorable attitudes toward the incorporation of ICT in their teaching methods.

Daudi and Nzilano (2019) conducted a study on “ICT integration in teaching and learning: Perceptions and practices of secondary school students in Tanzania.” The study employed a mixed method approach with a case study design. Data were gathered through focus group discussions (FGDs) and questionnaires from a total of 35 selected students, with 25 students completing the questionnaire and 10 participating in the FGDs. The analysis employed both thematic and descriptive techniques. The findings indicated that students had a positive perception of the integration of ICT in teaching and learning. Additionally, students demonstrated knowledge and skills in using various ICT tools such as laptops, desktop computers, smartphones, smart boards, and iPads. However, it was also found that students had

limited time for computer programs and were not permitted to bring their ICT devices to school. Furthermore, the use of ICT devices was primarily restricted to a computer course and not utilized across other subjects. This study was conducted in the Ilala district using a mixed-method approach, which is effective for gaining both a broad and in-depth understanding of the issue. Nonetheless, the choice of random sampling to select students for the study was not ideal; a non-random sampling technique would have been more appropriate.

2.8 Synthesis of Literature and Knowledge Gap

The reviewed literature from outside Tanzania has shown the importance of using ICT as a pedagogical tool to be used in classroom teaching and learning. Empirical literature from Tanzania explained various issues on the ICT paradigm to be used in an educational context such as the readiness of teachers, parents and students to incorporate and use ICT in schooling and the extent of integrating ICT in schools. For instance, Mwila (2018), addresses the attitudes of secondary school teachers toward the integration of ICT in the teaching process in the Kilimanjaro region in Tanzania; Kweka and Ndibalema (2018) conducted a study in Tanzania on "Constraints hindering adoption of ICT in government secondary schools in Tanzania: The case of Hanang district"; Daudi and Nzilamo (2019), assessed the ICT integration in teaching and learning, perceptions and practices of secondary school students in Tanzania.

Previous studies focused on articulating the views of education stakeholders such as students, parents and teachers on the use of ICT in learning and teaching, personal use of teachers and the use of ICT in school issues in different levels of education

such as in pre-primary, primary, secondary and higher learning institutions. Little has been explained about the assessment of challenges of using technology in the pedagogical context in their school. Therefore, there was a need for this study to assess challenges of using technology use in the pedagogical context in their school. The previous studies differ from this study in terms of time, study area, and the informants, and methodology.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methods of data presentation in the study on the challenges of technology use in effective teaching and learning in secondary school students in Tanzania It includes research approach, descriptions of the research design, area of the study, population, sampling procedures, instruments for data collection, analysis of the collected data and ethical consideration.

3.2 Research Approaches

According to Creswell (2009), there are three fundamental research approaches: mixed, qualitative, and quantitative. Denzin and Lincoln claimed that the qualitative approach takes a naturalistic, interpretive stance toward the world and suggests studying objects in their natural environments in order to understand or interpret the phenomena in terms of the meaning that individuals assign to them. The term "quantitative approach" describes the acceptance of a constant, unchanging external reality that can be objectively studied via the use of experimental, quantitative methods, which often include hypothesis testing.

The utilization of both qualitative and quantitative techniques in these methodologies appears to have provided researchers with the opportunity to gather comprehensive information. Additionally, triangulating data was made possible by the researcher's use of mixed approaches. It makes inferences to comprehend the study challenge by combining the capabilities of quantitative and qualitative data sets (Creswell, 2015).

3.3 Research Design

Research design refers to the overall strategy or blueprint that researchers use to conduct a study. It encompasses the methods and techniques for collecting, analyzing, and interpreting data, and serves as a framework for addressing research questions or hypotheses (Cresswell 2012). The research employed a partial mixed concurrent dominant status design, meaning that two techniques were applied simultaneously while one was dominating the other (Leech and Onwuegbuzie, 2009). This design was used in the study, where the qualitative method (QUAL+ quant design) predominated over the quantitative approach. According to Creswell (2009), this design was employed in the study to gather both subjective and objective data from different groups of respondents.

3.4 Area of the Study

The study was conducted in Arusha city. Arusha city is found in latitudes -3.386925, longitudes 36.682995. It is bordered by Kajiado county and Narok county to the North, the Manyara and Singida region to the South, Mara and Simiyu region to the west and Kilimanjaro region to the East.

Arusha city is one of the seven districts that make up the Arusha region of Tanzania, and the researcher gathered data from the area because they were familiar with it. It shares borders with the Meru district to the east and the Arusha rural district to the south, west, and north.

3.5 Target Population

According to Yin (2018), a population is a group of individuals or objects that a researcher has in mind and from which data can be gathered and conclusions drawn.

In this study, the targeted population included all teachers, head of schools, and students.

3.6 Sample Size

According to Cresswell (2012), a sample size is a tiny subset of the target population from which the researcher hopes to gather data for a population representation study. The sample of this study includes 5 head of schools, 10 teachers from each school and 40 students from each school. Hence, the study used a total sample size of 255 respondents.

Table 3.1: Demographic Distribution respondents from the Field

Total number of Respondents (N=255)

Secondary Schools	Teachers	Students	Headmasters
School (A)	10	40	1
School (B)	10	40	1
School (C)	10	40	1
School (D)	10	40	1
School (E)	10	40	1
Total	**50**	**200**	**5**

Source: Researcher Data (2022)

3.7 Sampling Techniques

According to Omari (2011), sampling is the act of determining which population units to include in a study. As a result, sampling procedures entail selecting a sample a small group of people from a larger group in order to represent others. In the investigation, both simple random processes and deliberate techniques were used. The explanation of the sample technique is provided below.

3.7.1 Simple random sampling

Students were chosen by simple random sampling. By selecting participants at random who would be accessible for the study, this strategy ensured that each participant had an equal chance of being chosen. In order to collect the sample, the researcher employed basic random sampling procedures, calling names at random from the student registration. The reason for using these techniques is to avoid biases because every student has a chance to be included. Simple random sampling techniques enabled a researcher to eliminate sampling bias.

3.7.2 Purposive sampling

In contrast, purposive sampling was employed in the study to choose key informant participants. Since head of school and teachers are in charge of employing technology in teaching and learning, purposeful sampling will be utilized to choose participants. This is because they were in a position to contribute information in accordance with research aims. Furthermore, the researcher employed the purposive sampling strategy to select teachers and school heads as study participants since they were thought to be particularly knowledgeable about the subject matter. These people were chosen through purposeful sampling due to their strategic positioning, positions held, and virtue of powers.

3.8 Data Collection Methods

The researcher used two different research methods to collect information to enable him to come up with answers for the research questions. These methods are: Interview guides and Questionnaires.

3.8.1 Questionnaires

Based on the study objectives, the researcher employed a combination of open-ended and closed-ended questions to gather information from the students on the phenomena under investigation. In this study, the researcher employed a questionnaire because it allows for data probing to yield more complete data and is an application-friendly, bias-free tool. There were both closed-and open-ended questions asked. An open-ended question facilitates the collection of more comprehensive data by complementing the answers provided by closed-ended questions. With the use of this tool, the researcher was able to communicate with a sizable sample of respondents who are proficient readers and writers. By offering all potential answers to closed-ended questions, respondents may choose the one that most accurately reflected their circumstances and so help obtain more detailed information. Through the use of open-ended questions, the respondents were given the opportunity to consider ideas outside the purview of the researcher, which helped the researcher gather more insightful data on the subject.

3.8.2 Interview and interview questions

The source of data collection from the head of school and teachers was semi-structured interviews. Based on the goals of the research, semi-structured interviews were performed to gather data on the phenomena under investigation. Because an interview guide is employed, doing a semi-structured interview has the benefit of keeping the conversation focused. According to Creswell (2014), the interview guide is designed to guarantee that every study participant provides the same information; nevertheless, planned responses are not included. Additionally, the interview guide

was utilized to make efficient use of the brief interview period by conducting more thorough and methodical interviews with a variety of subjects. They also aid in maintaining the focus of the interactions. The interview guide was written in English because the researcher believes head of school and teachers were able to express themselves in English. But when necessary Kiswahili was used.

3.9 Data Analysis Procedure

Kombo and Tromp (2007) define data analysis as a rigorous review of the collected and organized data used to compute measures and investigate patterns of relationships based on the data the researcher requested. Both qualitative and quantitative data were studied independently in this study, but the results were combined when they were interpreted.

The qualitative data collected through interview were analyzed through thematic analysis as provided by Clarke and Braun (2013) in order to reduce, identify and organize data into specific patterns. According to Clarke and Braun (2013) thematic analysis has the following stages and of which this study went through.

Step 1: Familiarizing with the data

Familiarisation with the content and understanding of the interview data began during data collection. For instance, during interviewing the correct impression and understanding of data was ensured by listening carefully to the interviewees, by posing follow-up questions to seek clarifications. This also included listening and re-listening audio records of interviews, transcribing voices into words and reading and re-reading the transcripts and extracts obtained in focus group discussion and documentary review to become intimately familiar with them.

Step 2: Generating initial codes from the data

Data gathered were repeatedly read one item after another to identify relevant texts. Through the drag-and-drop method, the relevant texts were put together in the respective free codes to form relevant data extracts. The task proceeded until the whole data set was completed. This process enabled the researcher to assemble data chunks that go together, and to condense the bulk data into readily analysable units.

Step 3: Searching for themes

At this stage the coded data with their extracts were critically re-read to determine which ones were more conceptually unified and related to the research questions. These ones were grouped together and merged to generate a common meaning, a theme. In grouping and merging the codes into themes, an effort was made to make the grouping process authentic following the two criteria of homogeneity and mutual exclusiveness. For instance, coded data were reflected upon to ensure that all codes forming a particular theme possessed a common conceptual feature. The obtained themes were assigned a name of between one and several words as a memo to focus on it.

Step 4: Reviewing the obtained themes

The next step was to thoroughly revise and countercheck the themes against the relevant text as well as against the entire raw data set to ensure that the correct meanings were sustained and that all information relevant to the study had been extracted fully. To achieve this, the process involved re-reading the transcripts, back-and-forth cycling between theory and data. Finally, a clear description of the themes

in relation to the research question which they were addressing was made, and a report was presented in the results chapter.

Step 5: Defining the themes

Here, each theme and sub-theme was named to indicate what theme was, what was interesting about the theme and which aspect of data were being captured.

Step 6: Report the findings

In this final step, order of the themes was identified on writing a report concerning the challenges of technology use in effective teaching and learning in secondary school, Tanzania where participants' arguments through verbatim quotations were presented.

To provide a general overview of the use of technology in guaranteeing effective teaching and learning, quantitative data from surveys was analyzed using the SPSS (Statistical Package for the Social Sciences - version 20) and descriptively presented through computed figures and percentages. In order to fully comprehend the research challenge, the findings from the quantitative and qualitative data were finally combined during interpretation. Tables, graphs, and text were therefore used to present the facts. Presenting data in form of tables, charts and graphs makes it easier for the reader to digest and grasp the content.

3.10 Validity and Reliability

Validity and Reliability of Research Instruments Reliability implies stability or dependability of an instruments or procedure in order to obtain information.

3.10.1 Validity of instruments

The degree to which data analysis results accurately reflect the phenomenon being studied is referred to as validity. The degree to which the study's variables are accurately represented in the data gathered is referred to as validity. Assessing if the questionnaire's content measures what it supposes to measure is the main goal of validity (Orodho 2010).

The pilot study was conducted in two secondary schools located in the Arusha Municipality in order to determine the reliability of the questionnaire; the outcomes of those two schools were not included in the study. According to Mugenda and Mugenda (2009), the accuracy of the data to be collected depends largely on the reliability of the research instruments. With this in mind, the results of the pilot study were then subjected to Cronbach alpha value in order to assess reliability of the questions and make changes if possible before the actual administering at the field. The result after computation processes found to be 0.8. Literature indicates that an instrument with Cronbach alpha value 0.8 and 0.7 is acceptable and reliable enough for study to go on. Therefore, research confirmed that the instruments were reliable enough for study to be carried out.

3.10.2 Reliability of instruments

Reliability, according to Thomas (2009), is the capacity of a research tool to yield consistent results across time. According to Mbwesa (2006), it describes how well a measurement yields consistent results. No matter when it is utilized, a reliable tool consistently yields consistent results for the same individuals.

The questions were put through face and content validity tests to make sure they were legitimate. The instrument's face validity is determined by both my supervisor's and my subjective assessment. Asking the ICT specialists to evaluate the tool allowed for the determination of its content validity. In order to include pertinent information on the difficulties associated with using technology in successful teaching and learning, a pilot test of the instruments was conducted to enhance their clarity and comprehensiveness.

3.11 Ethical Considerations

This study considered the needed research as explained below

3.11.1 Research clearance

The researcher acquired a written introductory letter from the director of postgraduate studies of the Open University of Tanzania (Appendix D) introducing the researcher to the district administrative secretary.

3.11.2 Confidentiality

Respondents were identified using code numbers or fictitious names rather than their true names in order to protect privacy and confidentiality. Additionally, the data collected from the participants was kept private between the researcher and responses and was only utilized for academic purposes.

3.11.3 Participants' informed consent

The researcher made sure that each participant understood the genuine nature of the study and its objective in order to respect their consent. Without any form of coercion, participants were asked to freely engage in the study.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the findings of the study in chronological order of the objectives of the study and research questions. The purpose of the study was to assess the challenges of technology use in effective teaching and learning in secondary school, Tanzania. The findings were analysed and discussed around three key objectives of the study namely; to assess the type of challenges of technology, use for effective teaching and learning in secondary school in Tanzania, To investigate the impacts of technology use to effective teaching and learning in secondary school in Tanzania and to identify possible measures to measures used to handle the type of challenges of technology use in effective teaching and learning in secondary school in Tanzania.

Data were collected from participants found in Arusha Municipality. Data were collected through semi-structured interviews, and questionnaires. The presentation, analysis and discussions are presented according to the study's objectives presented in chapter one as;

4.2 Demographic Information of respondents

In this study the demographic information of students, teachers and heads of schools from five secondary schools were obtained through face to face interview and questionnaires, that is, the demographic information a total sample of 255 participants were presented. The participants varied in terms of number and gender, as stipulated in 4.1, and chart 4.1 respectively

Table 4.1: Profile of Number Respondents The study comprises

Secondary School	Teachers	Students	Head of School
School A	10	40	1
School B	10	40	1
School C	10	40	1
School D	10	40	1
School E	10	40	1
Total	**50**	**200**	**5**

Source: Field Data (2022)

255 respondents were from secondary school, which includes school A, B.C, D, E secondary school. In each school the researcher used a sample of 10 teachers, 40 students and 1 head of school. The table below shows the distribution of respondents from three secondary schools

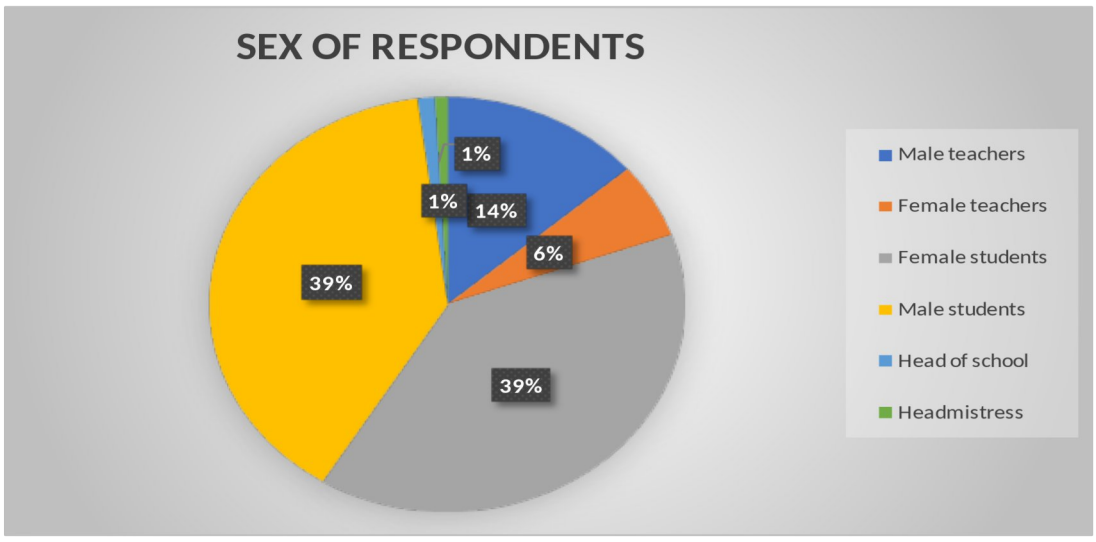

Figure 4.1: Distribution of Sex by Respondents

Figure 4.1show respondents included teachers, students, and head of school. The above figure indicates that there were 255 responders in total. The study employed

an equal sample size of male and female pupils, with 38% of each gender represented, and fewer female teachers than male teachers.
In Figure 4.1, 35 male teachers (16%) and 15 female teachers (15%) were employed by the researcher. Furthermore, there were three headmasters and two headmistresses.

4.3 Types of challenges of technology, use for effective teaching and learning in secondary school

Objective number one of this study was intended to assess types of challenges of technology, use for effective teaching and learning in secondary school. The main research question was what are the types of challenges of technology use in effective teaching and learning in secondary school in Tanzania?. To respond to this objective, participants were requested to identify and assess the challenges. Interview and questionnaires were used to collect data on this objective. The findings revealed the following as explained below.

4.3.1 Challenges of technology, use for effective teaching and learning in secondary school

Table 4.2: Economic Challenges

Level of agreement	Frequency	Percent
Strongly agree	27	42.2
Agree	19	29.7
Undecided	8	12.5
Disagree	5	7.8
Strongly disagree	5	7.8
Total	**64**	**100.0**

The results of the semi-structured interview showed a lack of government support for ICT education, despite the fact that the government has not yet proposed any policies

to encourage ICT instruction in schools. For example, ICT is not taught with the same seriousness as other subjects. According to a teacher, the Tanzanian government has not developed any policies aimed at improving the teaching of ICT in schools, which means that, in contrast to other topics, its teaching and learning opportunities are generally restricted. The majority of pupils fail their ICT exams as a result of this circumstance. One of the students said that,

> *They are compelled to learn for a brief period of time when using computers for instruction, which causes some students especially slow learners to not fully comprehend what is being taught. This happens when teachers assign limited time for students to utilize computers for learning.*

Moreover, during interview with Head of schools the findings revealed that inadequate supply of ICT experts to foster teaching process. There is a dearth of ICT specialists who can instruct complex computer programs, according to both respondents. In such instance, ICT learning and teaching were restricted. According to some students, there aren't as many teachers teaching ICT courses in their schools as there are pupils. According to study, one instructor can only instruct 40 students. In such a situation, kids are unable to learn efficiently and end up cramming because there aren't enough teachers to go slowly enough for them to understand. Additionally, the results showed that problems with bandwidth also frequently impair tech accessories, particularly software. Some responders clarified that there is occasionally a bandwidth issue when using technological instruments. Limited bandwidth means slow performance for sounds, graphics and videos, interrupting streaming and causing long wait for download. They argued that,

> *When they download their notes from the internet, they occasionally run into some issues. For example, when a network has low capacity, computers tend to run slowly. In that instance, they impact the process of teaching and learning.*

Table 2.3: Social challenges

		Frequency	Percent
	Strongly agree	4	6.3
	Agree	3	4.7
	Undecided	6	9.4
	Disagree	12	18.8
	Strongly disagree	39	60.9

The data presented in Table 4.3 reveals that the majority of respondents (60.9%) strongly disagree with the social challenges posed, indicating a significant level of disagreement with the notion that these challenges are prevalent or impactful within the context being studied. Additionally, a combined 18.8% of respondents disagree, while a smaller segment expresses uncertainty (9.4% undecided). In contrast, only 11% (6.3% strongly agree and 4.7% agree) affirm the presence of social challenges, suggesting that there is a general consensus among participants that such challenges are not a pressing issue. This distribution implies that while a minority sees merit in the argument concerning social challenges, the predominant view is one of skepticism or rejection, which may indicate a need for further investigation into the factors contributing to this perception.

Moreover, during the analysis of the finding it was revealed that there was technological challenges as mentioned below

Table 4.4: Technological challenges

Level of agreement		Frequency	Percent
Valid	Strongly agree	46	71.9
	Agree	8	12.5
	Undecided	4	6.3
	Disagree	2	3.1
	Strongly disagree	4	6.3
	Total	**64**	**100.0**

From the table 4.5 majority of participants strongly agreed there was a technological challenges. Additionally, an interview was conducted to corroborate this point. A

student expressed that a deficiency of technology tools has made it more difficult to use technology for teaching and learning. This is because there aren't enough technology accessories in schools. pupils claimed that the primary reason their education is being negatively impacted by the school's inadequate supply of electronic equipment is that there aren't as many projectors, PCs, or televisions available as there are pupils. In such scenario, learning takes place on a single computer that students must share. The research observed that students were sharing 1 computer to 20 students.

> *The available ICT facilities in my school are not enough to enable teachers to use them in classrooms. As you know to make good use of ICT in teaching and learning, you need to have more than one ICT device, for example, you need to have laptops that are easy to carry from one class to another along with a projector. Or if you have a TV then you need either a DVD player or a flash disk so that you can integrate them well. My school has desktop computers and few projectors to be used in some classes, then how can every teacher carry a desktop computer in each lesson?* (**Head, School E,.2021**)

The statements disagree with Mwalongo (2018) findings which revealed that ICT equipment such as tablets only were used in learning and teaching in the classroom. This indicates that the heads of schools' attitude towards ICT use in the classroom in his/her school context may be influenced by his/her attitude. Generally, the presence of ICT facilities only was insufficient; technical and pedagogical help for using ICT facilities in the classroom were required as UNESCO (2018) noted that the availability of ICT facilities in school should be supported with user training and continuous technical assistance. Therefore, good and quality ICT facilities could be accessible in schools; otherwise, they might be squandered if they are not fully utilized (UNESCO, 2021).

Moreover, the finding revealed that, another challenges affecting the use of technology in teaching and learning was inadequate supply of power especially in most schools tends to face power problem such that it becomes difficult for them to use technology tools even if they are available. One of the students said that,

> *Since there is no national grid, they use solar electricity while they study. Under such circumstances, they are compelled to use tech gear quickly.*

4.4 Impact of Technology Use in Effective Teaching and Learning

In order to improve students' academic performance, the researcher looked into the impacts of using technology in successful teaching and learning. The respondents were asked to select "YES" or "NO," and they also had to provide evidence to back up their decisions by citing specific ways in which technology has affected pupils' academic achievement. A significant portion of the respondents' answers focused on impacts, including increased knowledge, practical learning aids, time savings, difficulty for slow learners, accessibility, and method of presentation.

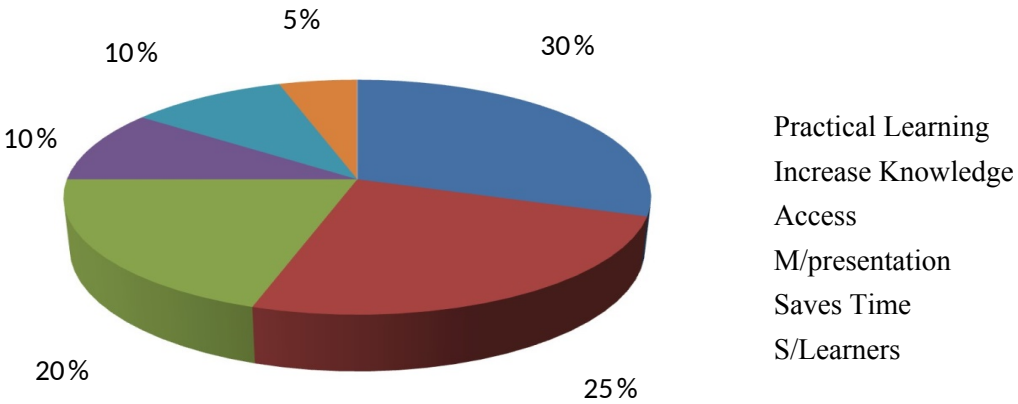

Figure 4.2: Impacts of using technology in Teaching and Learning Process

Source: Field Data (2022)

Figure 4.2 above shows the teachers and students responses on the question asked by the research which needed the respondents to show the impacts of using technology in Teaching and Learning Process,

4.4.1 Increase student Knowledge

Figure 4.3 illustrates that 25% of respondents stated that using technology in teaching and learning is the best way for teachers and students to create knowledge. The data showed that integrating technology into the teaching and learning process boosts student understanding. technological, according to the respondents, is the best medium for communication within educational institutions. Online resources and technological products can be applied thoughtfully and imaginatively. Moreover, technology can support the study of academic subjects and cross-curricular subjects.

> *… Since we purchased additional computers to aid in learning, our kids' performance in ICT classes has increased. Previously, we possessed a smaller number of computers that were unable to accommodate the needs of all the pupils. However, we purchased more computers last year, thus the academic advancement of the children has changed from prior years.* **(School C's head of school, 2022).**

The information gathered appears to support Bonnet's (2005) assertion that contemporary computers, accessories, networking, and resources within a growingly varied array of technologies are necessary for teaching and learning in the twenty-first century. ICT is a component of the student learning process that aids in improving the learning outcomes for students. The use of ICT can positively transmit knowledge to students, as evidenced by the availability of ICT resources that can improve learning by reducing the reliance on varying teacher quality and by making education available at home all day. ICT accessibility and use can also boost

learning through communication and assist students take use of a wealth of opportunities to gather knowledge for academic reasons.

For both teachers and students, the integration of technology into the classroom helps to build meaningful, applicable knowledge and learning capabilities. Additionally, students have the freedom to modify their own learning method to suit their needs and interests. To lessen embarrassment over their learning outcomes, kids can work according to their interests and repeat material as much as they choose. As a result, technology use can be adjusted to students' varied interests, social and cultural backgrounds, learning styles, and pace of acquisition.

4.4.2 It foster practical learning

As can be seen in figure 4.1, which represents 30% of the respondents, the results indicate that the use of technology during the teaching and learning process facilitates practical learning for both teachers and students. Students can eliminate cramming by using computers to perform tasks, see things in real life, and view pictures, dynamic images, videos, and photos. However, some have argued that using technology in the classroom motivates students to learn and makes most of them enjoy the material.. One of the head of school commented that;

> *Prior to the installation of technology in our school, including laptops, tablets, projectors, and other associated equipment, it was challenging for us to instruct kids since we frequently received queries from them that we were unable to adequately address. Nonetheless, modern technology has advanced to the point where pupils can now create new concepts and understanding through practical instruction rather than theory* **(Head of school from school E, 2022).**

The finding revealed that ICT facilities like laptop or computer was used to retrieve educative video that could enable to add knowledge to the subject content thought. It

was disclosed this video can be used by teacher during teaching preparation and after teaching preparation. Furthermore it was disclosed that teachers use this video during teaching in order to promote deeper understanding to the student for example during interview with HoS from school A said that

> *ICT provide room Audio visual video for teaching and learning. For example one I visited one teacher and found a particular teacher using projectors projecting a video showing how volcano eruptions happen, how magma move, lava and finally how it form volcanic mountains. The session was interesting such thing is what evidence that ICT is inevitable in teaching and learning* **(Head of school from school A, 2022)**

Another participant added that

> *I'm academic teacher, I teach English subject I always encourage my student and video in relation to the subject I'm going to teach. When I go to ICT lab, I use laptop to view you tube channel to see how other teachers teach a particular content and take what is important to improve the lesson during teaching.*

The above quotes imply ICT allow teachers and student to learn from educative video during teaching and learning. It was revealed that laptop, computer, tablet are used to access You tube channel and look how other teachers teach through online video. The teacher may learn and take appropriate things and use it during teaching and learning. This help student to have deepr understanding of the subject matter tought by a particular teacher.

4.4.3 It saves times

During the teaching and learning process, technology saves time. Figure 4.3 illustrates that 10% of the participants indicated that teachers can cover a subject in a short amount of time when they use technology. Additionally, some respondents mentioned that pupils grasp a subject more quickly when images are shown. When

teachers employ short bursts of time to explain some of the shown images, as opposed to using words only, it makes their job easier. The majority of educators and students agreed that using technology to facilitate learning makes teaching and learning easier. It also gives slow learners the opportunity to put concepts into perspective. One of the teacher argued that;

> *Because of its interaction, adaptability, and ability to integrate various media, technology tools are incredibly beneficial and productive when used in education. This allows for the study of individual variations among students* **(Teacher from school A, 2022).**

This study has resemblance to Bracewell (2016). Who claims that students can more easily access information sources outside of the classroom and use tools to analyze and interpret it, and that this allows them to conduct more in-depth investigations of the actual world? Systems that log data or operate online can be used to obtain information.

4.4.4 Help to receive feedback quickly

According to the Committee on Developments in the Science of Learning (2000), students can use the technology to get feedback, improve their comprehension, pick up new information, and transition from classroom to non-school environments. Due to logistical limitations and the volume of material that needed to be covered, it has previously been challenging to give this in schools. However, these issues can now be resolved with ICT.

Teaching staff members have no direct influence over physical barriers related to ICT integration (Loveless, 1996). The decisions on what to buy, where to put wiring drops, and where to put computers in centralized labs versus computer pods in classrooms are some of the infrastructure and accessibility challenges.

Computers in central laboratories may expose students to technology in an efficient and equitable manner, but this significantly restricts the technology's use for teaching in the classroom (Loveless, 1996). Teachers who use labs are deprived of the freedom to choose when to integrate technology into their lessons, which could give pupils the impression that computers have no place in the classroom or are not essential to learning. Technology therefore saves time during the learning process because it enables students to look up resources, assisting the instructor in providing an efficient and thorough explanation of the subject.

In addition, some respondents claimed that students can choose how to use interactive and collaborative tools and how to investigate the materials on their own while using technology, opening up new working options. The results showed that teachers can more easily access resources for teaching and learning thanks to ICT. Books, articles, and online notes that can be used for teaching and learning are available to teachers. However, it turned out that students were requested to look up information on various studied subjects on the computer room. During interview with participant revealed the following

> *Nowadays there is no way you can from using ICT material like laptop, computer to search material and prepare notes that could be used by teacher and student in teaching and learning process* **(Academic teacher from school 1, 2022).**

Another participant added that

> *No matter how teachers can escape from using ICT but the truth remain that ICT add advantage to teachers in accessing teaching material easily like online books. Likewise even student can be assigned to computer lab to access materials, notes purposively for learning* **(Head of school from school C, 2022).**

The quotation mentioned above imply that despite of teachers to use traditional ways of teaching but the use of ICT add value and advantage. Accessing teaching and

learning materials help in improving teaching and learning process since both teacher and student will be able to interact with teaching and learning materials through ICT facilities

Moreover the finding revealed that teaching and learning materials are accessed through reading and write notes through the use of internet or downloading books, notes or printing notes, teaching and learning aids that can be used to simplify teaching. During interview with one teacher it was revealed that

> *I said that there is no ways you can neglect learning because ICT provide opportunities for student and teachers to use Internet to read, sometimes to use Internet to download material and sometimes can use printer to print accessed materials from the internet(Teacher 1 from school C, 2022).*

This imply that student and teacher through using internet to access materials can interact with diverse teaching and learning materials as well as print notes that are used as the material for teaching and learning.

In addition to the benefits mentioned above, a few respondents also mentioned certain drawbacks that they believed came from using technology in the teaching and learning process. Based on the objectives, the researcher designed a question asking participants to evaluate the effect of technology use on students' academic achievement. The researcher asked the same question of each participant, and the replies are provided below.

Negatives impacts

Despite the advantages, the use of technology has also negative side as explained by various respondents as below;

In addition to the benefits mentioned above, a few respondents also mentioned certain drawbacks that they believed came from using technology in the teaching and learning process. Based on the objectives, the researcher designed a question asking participants to evaluate the effect of technology use on students' academic achievement. The researcher asked the same question of each participant, and the replies are provided below. Hence, it affects the flow of learning. Some of the teachers commented that;

> *When using technology, one needs to have certain hardware and software in certain areas, although paper notes can be read anywhere, such as at the bus stop and other locations. It was mentioned by some of the respondents that although most end users prefer to use technology for information searches, they typically read from printouts.*

Similar to Abrami's (2006) study, this one emphasizes the importance of computers in the classroom today. They inspire kids to learn and explore in ways that they could not have done without them. It is therefore an indispensable tool. Though occasionally, such as when the power goes out or there is a network issue, being overly reliant on internet resources may be problematic for the teaching and learning process.

Furthermore, the mode of presentation that is employed during the teaching and learning process is another problem. 10% of respondents stated that using some digital tools can have an impact on students' learning, as seen in Figure 4.3. For example, if a projected medium contains extremely frightening visuals, some students may become disengaged from their studies because they feel scared by the images or films.

Although the majority of students and teachers believe that technology tools enhance academic performance, 5% of respondents expressed concerns that slow learners may struggle with keeping up with the pace of technology in the classroom. For example, some students may have difficulty matching the speed of computer programs, causing them to fall behind and struggle to perform certain tasks. One of the teachers said that,

> *... A few educators and students expressed concern that society's moral fiber may be eroded by the use of technology, such as computers., for example, the majority of pupils who are learning computer skills open social networks like Facebook, Twitter, and WhatsApp. Some of them even choose to watch offensive content and images According to a teacher at school C (2022).*

Hellens (2009) discussed how the reliance on technology tools can lead to students becoming mentally lazy, as they may no longer have the motivation to seek information from traditional sources such as books. This trend is particularly prevalent in private schools, where students increasingly rely on internet sources for their learning materials. However, this dependence on the internet may not always provide reliable information for their academic needs.

4.5 Suggested Solutions to the Problems of Using technology in Secondary Schools

The researcher asked the respondents to give out solutions to the challenges of using technology tools in teaching and learning. The researcher provided open-ended questions to the respondents where the respondents both teachers and students were required to provide out some solution which can be used to promote the effective use of technology in order to facilitate students academic performance in secondary schools. The researcher used both qualitative and quantitative method in data

presentation some of the suggested Solutions from the respondents are shown on figure 4.3 below

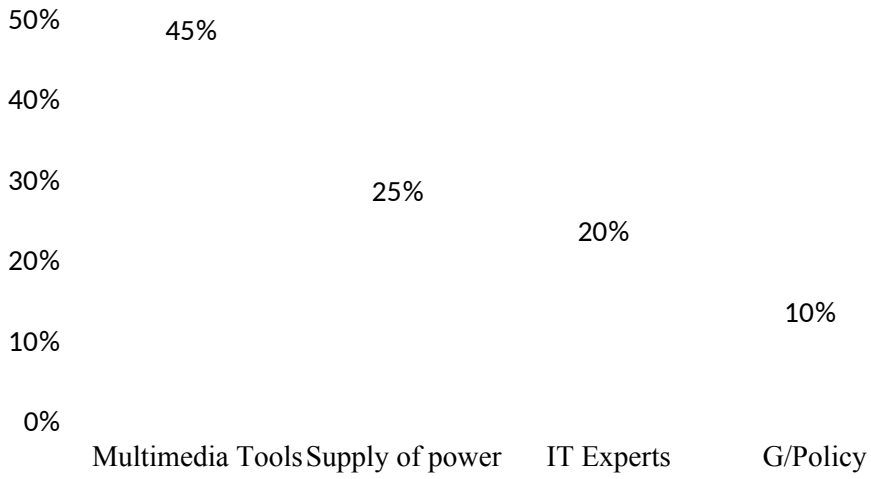

Figure 4.3: Solutions towards the Problems of using technology in Schools

Source: Field Data, 2022

G=government

As illustrated in Figure 4.3 above, forty-five percent of respondents recommended that schools have an adequate quantity of technological resources to support the teaching and learning process. According to some students, having an adequate supply of technology tools—such as computers, televisions, and projected media—will give them a better opportunity to learn than if they only have one computer. They also claimed that having an adequate supply of technology tools allows the teacher to assess each student's proficiency with a particular computer program. or other technological tools that are currently accessible

Enough electricity should be available to meet the demands of modern education technology. According to Figure 4.4, 25% of respondents agreed that electricity for technology equipment should be provided in accordance with the needs of the

school. Some respondents also stated that insufficient power supplies hinder students' ability to learn. In that scenario, using a generator for a brief period of time during study time is required of the pupils. Therefore, some of the questions are impossible to tackle on I.C.T.

Figure 4.3 indicates that 20% of respondents stated that the availability of IT specialists who will mentor them in their learning is necessary for the proper application of technological tools, which is why having these experts on hand would improve the quality of teaching and learning. They persisted in their claim that their ability to study is restricted by a lack of or insufficient IT specialists. In that instance, they recommended that the educational institution hire a sufficient number of IT instructors to improve the efficiency and affordability of instruction.

In Figure 4.3 above, 10% of all respondents stated that in order to increase the chances of students pursuing IT courses finding employment after school, the government should encourage schools that offer these courses. They went on to explain that the government has to work harder to encourage Tanzanian schools across the country to adopt technological tools for instruction and learning. Giving teachers and students rewards for their success in ICT classes is one way to achieve this.

The researcher wanted to know whether technology use is applied in secondary as during teaching and learning process. The students and teachers from the four secondary schools were the main target to this question. Below are their responses

Figure 4.4: Availability of Computers during Teaching and Learning

Source: Research field data (2022)

According to Figure 4.4, respondents from the four schools were unable to agree on whether or not they are being taught computer learning. This suggests that computer learning is a subject that is difficult for both the study and the students. School A respondents concurred that their institution uses technology for both teaching and learning. Moreover, 25% of students at school B strongly agreed that they typically utilize computers and other technologies for learning. The study found that during the teaching and learning process, access to computers and other technology equipment is necessary. However, private schools were mostly said to have access to this rather than public institutions. however, those who responded from schools C and D 65% of respondents disagree and strongly disagree that the teaching and learning process was hampered by the limited use of computers and other related technology, making it difficult for them to use them.

> *Because there are only so many computers available and because most students don't use them, we only learn through theories and the technology that supports them* **(Student, school C, 2022)**

Other participants added that

> *has not yet provided ICT facilities, I, in collaboration with the school board and my fellow teachers, are asking education stakeholders to help us by writing proposals. For example, we have written to Campaign for Female Education (CAMFED) and Vodacom foundation to help us provide ICT equipment, we are very grateful because they have helped us at least a little* **(Head, School A, 2022).**

The data above shows that a greater percentage of respondents strongly disagree that they are receiving computer studies instruction. After more research and student focus groups, the researcher discovered that, in contrast to government institutions, students in private schools were happy with the way the course was taught. In a focus group discussion in one of the schools the students responded that;

> *....“ "The computer lab has a small number of computers that were donated. The majority of us find it challenging to follow the teacher's instructions when we attend computer classes because we lack access to computers, and the classroom is frequently packed and cannot fit everyone.”*

Moreover other participants added that

> *We had staff, the school board and the parents’ meetings to ask for donations from the parents so that we can buy some ICT equipment. Also here at school, we have sources of income where we have grown crops and we are waiting for the price of those crops to raise so that we can sell those crops; the money that will be obtained we will be able to buy some of the ICT facilities* **(Head, School D, 2022).**

It is evident from the responses that all four schools have computers to some extent, but pupils are unaware of how and to what extent these tools are employed. Because they use computers for homework assignments across a variety of courses, students

in private schools are accustomed to seeing and utilizing computers as part of their education.

Things were different at government schools. Children in forms one through two attend the computer lab once a week for forty minutes. Since forms three and up do not take exams, teachers do not see the value in teaching children how to use computers if they will not be taking the test. This mindset deters pupils from becoming inquisitive or realizing the value of technological proficiency.

On the other hand, Heads of Schools were of the view that the government should make the use of ICT in the classroom mandatory. The Head of school **C** pointed out that in order to have a comprehensive implementation of the use of ICT in schools; the government should make specific and mandatory statements that enforce public secondary schools to use ICT: Head of school **B** said that:

> *I think the government should issue appropriate statements and plans as it has done in other matters. Currently, each school is implementing its own plans on ICT usage in the classroom. The government does not know anything about whether ICT is used in learning and teaching. If the government has its needs to implement it cannot fail, in education, for example, the government proclaimed that every school should have a laboratory and we saw them built. Now, this issue of the use of ICT in classrooms also needs emphasis from the government. At the moment the government has been silent on the use of ICT, I urge the government as it strives to put emphasis on controlling corporal punishment and put the same emphasis on the use of ICT in classrooms* **(Head, School B,.2022)**.

The statement made by Head of school B, that the government emphasis on the use of ICT was viewed as one of the strategies of using ICT in the classroom. The government's drive would be more effective than simply providing guidelines and policies that are often not implemented. It is quite true that there are things on which the government has been putting a lot of emphases and have been implemented well,

for example, the construction of laboratories in schools and regulating corporal punishments. Therefore, if the government emphasizes serious management in the use of ICT it will be an ambitious strategy of implementing ICT use in classrooms

Computer technology is an indispensable tool in today's classroom, according to Abrami (2006). It inspires kids to learn and explore in ways that were not possible for them to do before and is a tool that cannot be disregarded. In contrast, the responses provided by teachers who were interviewed about their experiences teaching computer studies in secondary schools within the Arusha Municipality were highly captivating and challenging to respond to. First, the educators concurred that, though to varying degrees, computer studies is taught in their schools.

According to respondents from government schools, this topic is not given attention because it is not a passing subject. This means that even if a student chooses to take the exam in the national form four exams, it will not affect their score. The respondents from the private schools had a lot to say about this topic. They not only teach it, but also encourage students to utilize computers for homework and study by trying to include them into the entire learning process.

According to the respondents, government schools do not have enough computers for students. For instance, in one government school, the student to computer ratio is 1:48. As a result, students are more likely to learn computer theory than practical applications. Private schools, on the other hand, appear to have more advantages over government schools. Private school respondents also mentioned that their pupils don't treat computer studies with the same seriousness as other elective courses like

math, physics, and other topics, despite having access to a sufficient number of computers and other resources like an internet connection.

Consequently, an examination of the state of computer subject instruction in schools has shown that computer subject instruction in private schools appears to be more successful than that which occurs in public schools. According to Gilmore (1995), one of the most important aspects of using computers for educational activities is having access to dependable and useful computer resources.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study was carried out to assess the challenges of technology use in effective teaching and learning in secondary school, Tanzania. This chapter presents the summary of the study, summary of the findings, conclusions and recommendations of the study.

5.2 Summary of the Study

The purpose of this study was to assess the challenges of technology use in effective teaching and learning in secondary school, Tanzania. The study was guided by three specific objectives, which are to: assess the type of challenges of technology, use for effective teaching and learning in secondary school in Tanzania, investigate the impacts of technology use to effective teaching and learning in secondary school in Tanzania, and identify possible measures to measures used to handle the type of challenges of technology use in effective teaching and learning in secondary school in Tanzania

The study employed the Technology Acceptance Model (TAM) by Davis (1989) and to be useful to give an in-depth description of the school management views on the integration of technology in teaching and learning. TAM is a theory of information systems that explains how technology is adopted and used by individuals. The actual use of the system is the end-point that technology is accessed by individuals. Behavioural intention is a consideration that encourages individuals to access the technology. The behavioural intention is informed by the attitude that is the overall

impression of technology (Davis, 1989). Literature related to ICT integration in teaching and learning outside Africa, Africa and Tanzania was reviewed accordingly. The review of literature revealed that issues related to ICT integration had been investigated. However, there is limited knowledge on school management views the ICT integration in teaching and learning in Tanzania. Thus, this study was designed to fill the knowledge gap through exploring the challenges of technology use in effective teaching and learning in secondary school, Tanzania.

This study was conducted in Arusha Municipality in five secondary school. The study adopted a mixed research approach whereby a partial mixed concurrent dominant status design; this was the design in which the two approaches were used at the same time while one of them is being dominating another (Leech and Onwuegbuzie, 2009). The study employed this design while qualitative approach being dominating quantitative approach (QUAL+ quant design). The sample of this study included 5 head of schools, 10 teachers from each school and 40 students from each school. Hence, the study used a total sample size of 255 respondents. These schools were conveniently selected due to the availability of ICT facilities. Data were gathered through interviews, questionnaire and documentary reviews.

Summary of the Study Findings

The summery of the key findings are presented according to the research objectives**.**

Types of challenges of technology, use for effective teaching and learning in secondary

The finding revealed that teachers lacked basic skills and knowledge of integrating ICT in teaching and learning. Lack of ICT-related skills and expertise was cited as a

barrier to ICT integration in their schools. Incompetence in skills and knowledge was key roadblock in achieving ICT educational objectives in schools. Findings revealed knowledge and skills on implementing ICT in teaching and learning depends on the availability of ICT facilities in schools

The impacts of technology use to effective teaching and learning

The findings revealed that the use of technology in teaching and learning process increases student knowledge. The finding revealed that technology help in making education less dependent on differing teacher quality and by making education available at home. Moreover, the finding revealed that technology fosters practical learning to both teachers and students during teaching and learning process, and help to to receive quick feedback on academic progress.

Measures used to handle the type of challenges of technology use in effective teaching and learning

The findings revealed that the improvement of school infrastructure should be one of the strategies in the implementation of ICT in classrooms. Since the school infrastructure was unfriendly and very dilapidated, so the government should first renovate the classrooms and install reliable electricity. The provision of ICT facilities in schools should be prioritized and accompanied with teachers training. Furthermore, the government needs to make a mandatory statement on the necessity of using ICT. They also suggested that teaching and learning via ICT should start from primary schools to help pupils familiarize themselves with ICT before joining secondary education. Another tactic put forth was that the Ministry of Education, acting on behalf of the government, should provide uniform resources for teacher

ICT training. The study discovered that teachers were trained in ICT skills and knowledge using disparate training manuals in over three schools.

5.3 5Conclusions

Based on findings, the following conclusions are made.

It was difficult for school to succeed on ensuring effective integration of ICT in teaching and learning due to some limitation like unavailability of ICT facilities, and lack of conducive environment. Lastly, the study concluded that despite the school through different strategies including ensuring electricity availability, Encourage professional development and requesting in service training, Encouraging teachers using their own ICT facilities, and Establishing ICT resource center/ lab was the school measures on ICT integration in teaching and learning.

5.4 Recommendations

Based on the major findings and conclusions of this study, the following recommendations are made.

5.4.1 Recommendations for action

5.5.2 Recommendations for further research

In today's rapidly evolving educational landscape, the integration of Information and Communication Technology (ICT) into teaching and learning processes has become paramount. To enhance this integration, several recommendations are made for the government, educational stakeholders, and school management.

Firstly, it is essential for the government, through the Ministry of Education, Science and Technology, to ensure the provision of a conducive learning environment that

positively influences ICT integration in educational settings. A supportive infrastructure, which includes reliable internet access and modern equipment, lays the groundwork for successful technology implementation in classrooms.

At the school level, teachers must adapt to technological advancements by acquiring essential skills pertinent to the 21st century. Specifically, computer proficiency is vital for educators aiming to integrate ICT into their teaching practices effectively. Professional development initiatives should be prioritized, enabling teachers to develop the necessary competencies to leverage technology in their pedagogy and enhance the learning experience for their students.

Additionally, it has been observed that many schools lack adequate ICT facilities. To address this gap, schools should actively collaborate with various educational stakeholders, including government bodies, NGOs, and private sector partners, to secure the resources required for ICT integration. This partnership approach can facilitate the availability of technological tools and infrastructure, supporting the effective incorporation of ICT into teaching and learning activities.

Moreover, in-service training programs focused on the use of ICT in education should be provided by the government in collaboration with different stakeholders. These training sessions will empower teachers with the knowledge and skills required to utilize technology effectively in their classrooms. A comprehensive understanding of ICT tools will enhance educators' confidence and competence, ultimately leading to more effective teaching and improved student outcomes.

Lastly, school management plays a crucial role in fostering a positive attitude towards ICT usage among both teachers and students. It is recommended that school

leaders employ various management techniques to influence and motivate educators and learners alike. By emphasizing the importance of technology in a globalized world, school management can cultivate an environment where the benefits of ICT are recognized and embraced. This proactive approach will encourage both teachers and students to engage with technology in meaningful ways, enhancing their educational experience and preparing them for the demands of the modern world.

In conclusion, the successful integration of ICT into teaching and learning requires a multifaceted approach involving government support, teacher development, strategic partnerships, and effective school leadership. By implementing these recommendations, stakeholders can create a rich educational ecosystem that empowers both educators and students to thrive in an increasingly digital world.

5.4.2 Recommendations for further studies

The integration of Information and Communication Technology (ICT) in education has become increasingly important in today's digital age. To further understand its effectiveness in promoting teaching and learning, it is crucial to conduct additional studies focusing on several key areas. First, it is necessary to assess the effectiveness of the strategies that schools have adopted for promoting ICT in educational practices. By evaluating these strategies, researchers can identify the most successful approaches and discern ways to enhance the use of technology within the classroom. This insight can lead to well-informed recommendations for educators and policymakers aiming to harness the potential of ICT in education.

Moreover, there is a pressing need to conduct studies specifically targeting primary education. Primary education serves as the foundation for subsequent levels of

learning. If ICT integration proves effective at this foundational stage, it will likely ease the transition and adoption of technology in higher levels of education. Exploring how ICT can be integrated successfully within primary schools will help build a robust framework for technology-enhanced learning that can benefit students throughout their educational journeys.

In addition to qualitative assessments, it is also important to carry out similar studies using quantitative methods or a mixed-methods research approach. Utilizing diverse research methodologies allows for a more comprehensive understanding of the impact of ICT integration in teaching and learning. Quantitative studies can provide statistical evidence that supports or challenges existing findings, while mixed-methods research can offer richer, more nuanced insights that combine the strengths of both qualitative and quantitative approaches. By comparing and generalizing findings across different methodologies, educators can develop a more accurate picture of how ICT influences educational outcomes and make more effective decisions regarding its implementation.

In conclusion, the recommendation for further studies in these areas is vital for advancing the understanding of ICT's role in education. By examining the effectiveness of current strategies, focusing on the primary education level, and employing varied research methods, we can establish a solid base for integrating ICT in teaching and learning. This will ultimately contribute to enhanced educational experiences and outcomes for students at all levels.

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APPENDICES

APPENDIX A: QUESTIONNAIRE FOR STUDENTS

My name is Raphael Chelula, a postgraduate student from Open University of Tanzania Arusha campus. I am conducting a research on the challenges of technology use on effective learning in Secondary School Students in Tanzania, A Case of Arusha Municipality. This work is one of the requirements needed for the partially fulfillment of The Post Graduate Degree of Open University of Tanzania. I kindly request you to participate in this study by answering the following questions. All the information that you will provide is for academic purpose only and it will remain confidential.

INSTRUCTIONS

1. Put a tick (√) besides the answer if you think the best describe your opinion.
2. In some instance, you may have to give opinion by filling in the blanks.
3. Do not write your name on this paper.

Date.....

Name of school.....

District.....

4. Gender

a) Male ( ) b) Female ( )

vi) Form

a) One ( ) b) Two ( )

c) Three ( ) d) Four ( )

1. Briefly explain the meaning of ICT

……

……

……

2. Mention ICT devices that are used by your teacher in teaching and learning

i. .....

ii. .....

iii. .....

3. (a) Do you think ICT devices can help you in learning?

i. Yes ( )

ii. No ( )

b) Justify your answer

.....

.....

.....

4. (a) For how long have you been using Information Communication and Technology in learning in your school?

i. Less than a year ( )

ii. One year ( )

iii. Two years ( )

iv. Three years ( )

v. More than three years ( )

5. How frequent do you use Information and Communication Technology in promoting effective teaching and learning in your school?
   i. Always ( )
   ii. Often ( )
   iii. Sometimes ( )
   iv. Rarely ( )
   v. Never ( )
6. To what extent does the use of Information Communication Technology promote your academic progress?
   i. Not at all ( )
   ii. To a small extent ( )
   iii. To some extent ( )
   iv. To a great extent ( )

7. What are the effects of using ICT in effective teaching and learning?
   i. .....
   ii. .....
   iii. .....
8. What are the main advantages of using ICT in promoting effective teaching and learning?
   i. .....
   ii. .....
   iii. .....

Thank you for you Cooperation

APPENDIX B: QUESTIONNAIRE FOR TEACHERS

Dear Teacher,

My name is Raphael Chelula, a postgraduate student from Open University of Tanzania-Arusha campus. I am conducting a research on The Challenges of Technology Use on Effective Learning in Secondary School Students in Tanzania, A Case of Arusha Municipality. This work is one of the requirements needed for the partially fulfillment of The Post Graduate Degree of Open University of Tanzania. I kindly request you to participate in this study by answering the following questions. All the information that you will provide is for academic purpose only and it will remain confidential.

Date.....

Name of school.....

District.....

Gender

a) Male ( ) b) Female ( )

vi) Form

a) One ( ) b) Two ( )

c) Three ( ) d) Four ( )

1. Do your students understand the meaning of ICT?

……

……

……

……

2. Mention ICT devices that you use in during teaching and learning

   i. .....

   ii. .....

   iii. .....

3. (a) Do you think ICT devices helps you in teaching process?

i) Yes ( )

ii) No ( )

b) Justify your answer

.....

.....

.....

.....

4. (a) For how long have you been using Information Communication and Technology during teaching and process?

   i. Less than a year ( )

   ii. One year ( )

   iii. Two years ( )

   iv. Three years ( )

   v. More than three years ( )

5. How frequent do you use Information and Communication Technology in promoting effective teaching and learning?

   i. Always ( )

   ii. Often ( )

iii. Sometimes ( )

iv. iarely ( )

v. Never ( )

6. To what extent does the use of Information Communication Technology promote your students' academic progress?

i. Not at all ( )

ii. To a small extent ( )

iii. To some extent ( )

iv. To a great extent ( )

7. What are the effects of using ICT in effective teaching and learning to your students academic progress?

i. .....

ii. .....

iii. .....

8. What are the main advantages of using ICT in promoting effective teaching and learning?

i. .....

ii. .....

iii. .....

THANK YOU FOR YOUR COOPERATION

APPENDIX C: INTERVIEW TO THE HEAD OF SCHOOL

1. Do your students understand the meaning of ICT?
2. What are the ICT devices that are available in your school? Mention at least three of them.
3. Briefly explain how do ICT devices help your teacher during teaching and learning process?
4. For how long have been your school use Information Communication and Technology during teaching and process?
5. How frequent do you use Information and Communication Technology in promoting effective teaching and learning?
6. To what extent does the use of Information Communication Technology promote your students' academic progress in your school?
7. What are the effects of using ICT in effective teaching and learning to your students' academic progress?
2. What are the main advantages of using ICT in promoting effective teaching and learning?

THANK YOU FOR YOUR COOPERATION

APPENDIX D: RESEARCH CLEARANCE LETTER

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Our Ref: PG201700901

22nd September 2021

City Director,

Arusha City Council,

P.O.Box.3013,

ARUSHA.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. CHELULA, Raphael, Reg No: PG201700901** pursuing **Masters of Education in Administration, Planning and Policy Studies (MEDAPPS).** We here by grant this clearance to conduct a research titled **"The Challenges of Technology use in Effective Teaching and Learning in Secondary School Students in Tanzania".** He will collect his data at your area from 23rd September 2021 to 22nd October 2021.

In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam.Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours,
THE OPEN UNIVERSITY OF TANZANIA

Prof. Magreth S.Bushesha
DIRECTOR OF POSTGRADUATE STUDIES.

APPENDIX E: RESEARCH PERMIT LETTER

UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENTS

ARUSHA CITY COUNCIL

All correspondences addressed to:
Phone: +255 27 2508073/2503494 (Director)
+255 27 2544330 (General)
Fax: +255 27 2545768

City Director,
20 Boma Street,
P.o Box 3013,
23101, ARUSHA,
e-mail: cd@arushacc.go.tz
Website:www.arushacc.go.tz

HALMASHAURI YA JIJI LA ARUSHA

On reply please quote:
Ref. No. CD/R.30/32/VOL.IV/32

Date: 28/09/2021

Head of school THEMI SECONDARY SCHOOL
ARUSHA DAY SECONDARY SCHOOL
FELIX MREMA SECONDARY SCHOOL
KAROLENI SECONDARY SCHOOL
NGARENARO SECONDARY SCHOOL

RE: RESEARCH PERMIT

Reference is made to your letter with the above caption.

I would like to inform you that permission is granted CHELULA, Raphael to collect data according to his/her research needs within Arusha City Council.

Please assist the student in the stated area for the purpose of completing studies successfully.

Thanks in advance for your cooperation.

MKURUGENZI WA JIJI
V. A. Mea... HALMASHAURI YA JIJI LA ARUSHA
For. ARUSHA CITY DIRECTOR

Copy: Arusha City Director

RESEARCH TITLE; THE CHALLENGES OF TECHNOLOGY USE IN EFFECTIVE TEACHING AND LEARNING IN SECONDARY SCHOOL STUDENTS IN TANZANIA.