THE INTEGRATION OF ICT IN THE IMPLEMENTATION OF COMPETENCY-BASED CURRICULUM: A CASE OF MOSHI MUNICIPALITY -TANZANIA

PROSCOVIA NOVATUS

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMNTS FOR THE DEGREE OF MASTER OF EDUCATION IN QUALITY MANAGEMENT (MED-QM)

DEPARTMENT OF EDUCATION PLANNING AND ADMINISTRATION

OF THE OPEN UNIVERSITY OF TANZANIA

2025

CERTIFICATION

The undersigned certify to have read and hereby recommend for acceptance by the Open University of Tanzania a dissertation entitled, "***Assessing the Integration of ICT in the Implementation of a Competence-based Curriculum: A case of Moshi Municipality – Tanzania"***. In partial fulfilment of the Requirements for the Degree of Master of Education in Quality Management (MED-QM).

…….

Dr. Karoli Mrema

(Supervisor)

…….

Date

…….

Dr. Winfrida Malingumu

(Supervisor)

…….

Date

COPYRIGHT

DECLARATION

I, **Proscovia Novatus,** declare that, the work presented in this dissertation is original. 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 this regard that I declare this work as originally mine. It is hereby presented in partial fulfilment of the requirements for the Degree of Master of Education in Quality Management (MED-QM) of the Open University of Tanzania.

……..……

Signature

……..

Date

ACKNOWLEDGEMENTS

I would like to thank all the institutions and people who helped a lot with writing this study. Their contributions are recognised. I am very thankful to the living and powerful GOD for giving me the courage and strengths to finish this study.

I also want to thank my supervisors, Dr. Karoli Mrema and Dr. Winfrida Malingumu, for all the hard work they put into making sure I could finish my study as planned. I am also truly grateful to my employer the Executive Director of Moshi Municipal Council, for allowing me to complete my study.

Additionally, I am grateful to the District Educational Officer for allowing me to collect data for this report. I am very appreciative of the time and effort that the heads of school and teachers from the sampled schools dedicated to the data collection procedure. I am deeply grateful to my family and my son, Allen Elisha Salenda, for their unwavering support and encouragement during my study.

ABSTRACT

This study assessed the integration of ICT in the implementation of comptence-based curriculum (CBC) in public primary schools in Moshi Municipality-Tanzania. Specifically, it explored the availability of ICT facilities in implementing the competency-based curriculum; determined teachers' perception in integrating ICT into their lessons in implementing the competency-based curriculum; and examined the challenges facing teachers in integrating ICT in the implementation of CBC. The study employed mixed methodology following a pragmatic research paradigm and convergent parallel design. The study used a sample of 266 respondents. The methods for data collection were questionnaires administered and in-depth interviews using an interview guide. The quantitative data were analysed through descriptive statistics with the help of Statistical Package for Social Science (SPSS) and thematic analysis was also used to analyse qualitative data. The findings revealed that; First, mobile devices (smartphone) with Internet access and e-mail functionality (75.5%), laptops (67.3%), mobile device (tablet) with Internet access and e-mail functionality (61.6%) and desktop computers (60.4%) were mentioned to be available to majority of the study participants. Second, the majority were of the opinion that integration of ICT in implementing CBC is core for delivering quality education to pupils. Third, the study discovered the main challenges facing the integration of ICT in implementing CBC were lack of ICT facilities (39.2%) and inadequate of digital infrastructure (32.2%). The study concludes that, ICT integration in the teaching and learning CBC was a requirement for improvement of quality education provision to meet Sustainable Development Goal 4 Target 4.1 though it was encountered with some challenges. This implies that the implementation of CBC was not being well integrated with ICT hence the provision of quality education remains questionable. The study recommends supply of ICT facilities and construction of digital infrastructures to schools. Among others, further studies be conducted on ICT integration.

Keywords: *Integration of ICT, competence-based curriculum, perceptions, computer, internet*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

AKM	Assessment Competency Minimum
CBA	Competence-based approach
CBC	Competence-based Curriculum
CBE	Competence-based Education
CBET	Competence-based Education and Training
CFT	Competency Framework for Teachers
DSQAO	District School Quality Assurance Officer
ICT	Information and Communication Technology
IT	Information Technology
PD	Professional Development
PPE	Pre-Primary Education
SSA	Sub-Saharan African
SPSS	Statistical Package for Social Sciences
UNESCO	United Nations Educational Scientific and Cultural Organisation
US	United States
UK	United Kingdom

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE PROBLEM

1.1 Introduction

This chapter encompasses the following: background of a problem, statement of the problem, research objectives, and research questions, significance of the study and definition of significant terms.

1.2 Background of the Problem

The integration of Information and Communication Technology (ICT) into the implementation of the competency-based curriculum for basic education school has attracted the attention of numerous researchers (Ghavifekr et. al., 2014). A competency-based curriculum is a learner-centred approach that stresses the acquisition of life-relevant knowledge, abilities, and attitudes (Rutayuga, 2014). Countries throughout the world are implementing major curriculum reforms to better prepare students for the higher education and labour market demands of the 21st century (Rutayuga, 2014). The purpose of education is to produce a labour force that meets the needs of the labour market. In education, information and communication technology have received appropriate attention (Cleary & Van Noy, 2014). In a worldwide situation, academic organisations of all levels including primary schools recognise ICT integration, as an entryway for refining the delivery of education (Li at el., (2022).

United Nations and other global education partners have faced more challenges on integrating ICT and decide to put it into their own development agendas (Fengchun

& Nanaieva, 2015). It aimed to provide a crucial element for governments to build legal frameworks for the incorporation of ICT into Education Masterplans. The use of ICT in education is vital because it facilitates more efficient and effective learning (Shopova, 2014). Through the use of ICTs, students are able to increase their subject-area comprehension and generate new knowledge. This can be applied ingeniously to solve the complicated problems facing contemporary society UNESCO, (2011).

According to Agyei, (2021), ICT integration in Sub-Saharan African schools (Kenya, Tanzania, Uganda, Ethiopia, Ghana, and Nigeria) has long been intended to improve elementary and secondary subject teaching and learning which integrates ICT into school organisational and curriculum procedures. Effective professional development in ICT integration into school organisation and curriculum practices have persistent effects on teaching and learning, particularly in Sub-Saharan areas and similar situations. Therefore, in integrating ICT efforts, a good professional development (PD) programme is crucial. According to Nsengimana et al. (2020), the Competence-Based Curriculum (CBC) has been established in several Sub-Saharan African (SSA) nations to increase education quality, but the curriculum is still administered in traditional ways. Thus, CBC is not meeting individual and national socioeconomic demands as envisioned. The authors are concerned about how CBC is being implemented in other SSA nations that have recently adopted this curriculum and how others will adopt it. Also, they explain how CBC can be implemented in SSA nations with similar socioeconomic and environmental situations and how to include new ideas (Nsengimana et al., 2020). Therefore, construction of "laboratory" schools

or science education centres and school-based communities of practice to increase knowledge and promote current teaching methods for effective integration of ICT.

East African Community partner nations adopted a competency-based curriculum in 2013 to align their education systems with the global trend of competency-based education (M'mboga Akala, 2021). A curriculum is seen as a way to teach students important values, information, attitudes, and skills for personal and national growth. It was reported that inadequate ICT infrastructure in schools, making technology integration challenging during the new curriculum (Ghavifekr et al., 2016). Although it was believed that computer use was vital, there were several problems incorporating technology into classrooms (Ghavifekr & Rosdy, 2015). Tanzania switched from a knowledge-based to a competence-based curriculum eight years ago in primary and secondary schools. The main objective of the shift was to produce competent students who can not only meet the demands of the job market but also use their skills for personal growth. However, a study done by Nkya et al., (2021) in Arusha region, noted that lack of ICT in implementing competence-based curricula in secondary schools, cause the implementation to be ineffective.

A case study of learning materials used to deliver knowledge and skills or competency-based curriculum in Tanzania, examining the extent to which the competency-based ethos that are communicated in the books and learning materials used to deliver it in grade 4 and grade 7 classrooms in Tanzania (Mosha, 2012). Learning materials, particularly ICT, are used to deliver CBC were insufficient for promoting critical knowledge, skills, and qualifications for sustainable development

in Africa (Nsengimana et al., 2020; Mosha, 2012). Institutions should design and implement an effective response to promote common core skills for lifelong learning and development in Africa.

According to a study done by Tandika and Ndijuye, (2019), identify pre-primary preparation in incorporating ICT in classroom instruction and the hurdles teachers face when attempting to integrate it for children's meaningful learning. However, teachers perceive inadequate ICT facilities in schools, posing a difficulty for the integration of technology during the implementation of CBC. Compared with the goal of CBC of generating competent students who can not only fulfil the needs of the job market, but also utilise their abilities for personal development (Nzima, 2016).

After reviewing the National ICT Policy of 2003 (NICTP 2003) the government of Tanzania came up with the National ICT Policy 2016 formulated with the context of national vision statements guided by the Tanzania Development Vision 2025, it recognises that ICT is central to a competitive social and economic transformation by stating that “Adequate investments are made to improve the quality of science-based education and to create a knowledge-based society in general.”

Most of the studies (Nsengimana et.al.,2020; Ghavifekr & Rosdy, 2015; Mosha,2012 and Tandika & Ndijuye,2019) indicate that inadequate ICT facilities seems to be a hindrance of integration of ICT in implementation of competence-based curriculum. The study conducted by Nkya,(2021) and Agyei, (2021) revealed that time limited, unwillingness and lack of proffessional development in integrating ICT also affects

the implementation of CBC. If the problems are left unchecked as claimed by the above studies, the problem will expand and create a chronic disease of producing students lacking skills,attitude and values which accompany the 21st century goals. Hence there is a need of assessing the integration of ICT in implementation of CBC specifically in Moshi Municipal. Therefore, there is scant information on the integration of ICT in implementing CBC in primary schools in the context of Moshi Municipal. Therefore, this study intended to assess the integration of ICT in the implementation of the competency-based curriculum for public primary schools in Moshi Municipal.

1.3 Statement of the Problem

Despite the fact that integration of ICT in the implementation of the CBC is about eight years old since was last reviewed in 2015 for primary and secondary schools in Tanzania and the efforts that have been made by the government of Tanzania, the implementation is not actually in good condition when we compare it with the standard of quality education, attained by learners. This may be evidenced by t (Nsengimana et.al.,2020; Nkya,2021; Stephen, 2022; Agyei,2021; Ghavifekr & Rosdy, 2015; Mosha,2012 and Tandika & Ndijuye,2019).

However, notwithstanding all these problems, there is scanty information about the integration of ICT in the implementations of CBC in relation to quality education provision to public primary school learners as studies which have been conducted focused more on how ICT integration has been integrated in implementation of CBC for secondary schools in Tanzania. However, significant amount of time has passed since CBC was implemented in Tanzania and it is not known what went wrong to the

extent of having students with low academic knowledge,skill, values and ability on ICT. Therefore, for determination of whether or not integration of ICT in implementation of CBC is effective, and what went wrong and the way foward,, this study was conducted to assess the integration of ICT in implementation of CBC to public primary schools in Moshi Municipality, Tanzania.

1.4 Research Objectives

1.4.1 General Objective of the Study

The general objective of this study was to investigate the integration of ICT in the implementation of CBC to public primary schools in Moshi Municipality-Tanzania.

1.4.2 Research Objectives

i. To explore the availability of ICT facilities in implementing the competency-based curriculum in public primary schools in Moshi Municipal.
ii. To determine teachers' perception in integrating ICT into their lessons in implementing the competency-based curriculum in public primary schools in Moshi Municipal.
iii. To examine challenges in integrating ICT in implementation of CBC for public primary schools in Moshi Municipal.

1.5 Research Questions

i. What is the availability of ICT facilities, for integrating technology in implementation of the competency-based curriculum for public primary schools in Moshi Municipal?

ii. What are the teachers' perceptions on integrating ICT into their lessons in implementing the competency-based curriculum for public primary schools Moshi Municipal?

iii. What are the challenges for integrating ICT in implementation of CBC for public primary schools in Moshi Municipal?

1.6 Significance of the Study

The study investigated the integration of ICT in the implementation of CBC to public primary school in Moshi Municipality-Tanzania. The results of this study are anticipated to help the policy makers and planners of education to demonstrate ICT integration policies and practices by engaging in continuing education ICT training programmes. Additionally, it will assist various stakeholders in the education sector, including administrators, and curriculum specialists, in recognising the significance of preparing teachers to integrate ICT into a competence-based curriculum in public primary schools. This will be achieved through substantive contributions and informed decisions regarding the implementation of the curriculum. The Ministry of Education, Science and Technology (MOEST) may utilise the results of this study to organise further seminars, workshops, and teacher in-service programmes to ensure that instructors are appropriately prepared for the implementation of CBC. The investigation may also produce data that could constructively modify educators' perspectives regarding the integration of ICT.

Furthermore, this study may improve education and learning outcomes by giving students more power and creativity over their learning, and promoting a holistic

learning approach increasing classroom productivity and collaborative work. Also, it will improve concentrations and comprehension on the activities carried out through digital and interactive tools increase students' concentration and assimilate concepts more quickly for enhancing learning. The availability of ICT facilities, a substantial difficulty will be addressed. Hence, this research contributes to the existing body of knowledge regarding the evaluation of strategies implemented by primary educators in Moshi Municipality to include ICT into computer-based competency.

1.7 Delimitation of the Study

The study focused on the integration of ICT in the implementation of CBC to public primary school in Moshi Municipality-Tanzania.The study covered 20 public primary schools out of 39 public primary schools in Moshi municipal council, Kilimanjaro- Tanzania which was sampled randomly as the representative of municipal council primary schools. The study was confined to District School quality assurance officers (DSQAO), head teachers and classroom teachers.

1.8 Limitations of the Study

The study was conducted in a public primary school in Moshi Municipal, which restricted the generalisability of the results to other places. The respondents may have refrained from disclosing certain information due to concerns regarding the potential disclosure of their ICT integration in the context of the implementation of competence-based curriculum. Nevertheless, the researcher mitigated this by informing the respondents of the study's objective and assuring them that their

identities would not be revealed. Additionally, the respondents encountered difficulties with the language employed to pose the question during quantitative data collection. Respondents were assisted by translating the query to ensure that the required responses were acquired.

1.9 Definition of Key Operational Terms

Curriculum: All that is intended to facilitate the learner in acquiring the intended attitude, skills, and knowledge is referred to as "it."

Competence-Based Curriculum: Curriculum that emphasises the practical application of the acquired skills rather than mere memorising of subject matter.

Implementation: refers to the methodology and procedures employed by educators within the classroom setting to proficiently implement the competency-based curriculum. It also denotes the manner in which instructors conduct evaluations and impart knowledge by utilising designated materials as outlined in the curriculum.

ICT: Is a broad term that covers the use of various technologies, systems and tools to create, store, transmit and manipulate information. It includes both hardware and software components such as computers, smartphones, servers, networks, software applications, radios, television, and internets.

Integration of technology: The process of interfacing or connecting disparate platforms, software, or devices in order to facilitate data interchange and collaboration. Or integration of technology pertains to the procedure of constructing or utilising a system that integrates various technological components, including but not limited to cloud computing, artificial intelligence, and the internet.

1.10 Organisation of the Report

This research report is organised into six chapters. Chapter one presents introduction and background of the study; the statement of the problem; general objective of the study; specific objectives of the study; research questions; delimitation of the study; limitation of the study, significance of the study, definition of operational terms; and organisation of the report. Chapter two is about the literature review which covers theoretical literature, empirical studies, synthesis and research gap, and conceptual framework. On the other hand, Chapter three presents the research methodology which covers research philosophy, research approach, research design, study area, study population, sample and sampling techniques, methods of data collection, and validity and reliability, data analysis and ethical considerations. Chapter four presents the findings, chapter five covers the discussion of the findings, and chapter six stretches the summary of the study, conclusion, implication and recommendations of the study.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1 Introduction

This chapter reviews various literatures regarding the integration of ICT in the implementation of Competence-Based Curriculum. The theoretical literature, empirical literature or studies on the availability of ICT facilities, perceptions of teachers regarding ICT competencies and the challenges of integrating ICT into implementation of a competency-based curriculum; synthesis and research gap, and conceptual framework of the study.

2.2. Theoretical Framework

The integration of ICT on the implementation of competence-based curriculum (CBC) is founded upon several theories that have undergone development throughout time, thus facilitating the creation of instructional and learning exercises to be used by students with the help of ICT. The study was guided by constructivism theory.

2.2.1 Constructivist Theory

The researcher utilised two constructivist approaches to help teachers comprehend individual and group learners. The first theory is that of Jean Piaget's constructivism that aim at individuals and groups (Bahufite, 2017; Murithi & Yoo, 2021). The theory says “learners absorb new information that expands their understanding”. Based on this theory, teachers taking on ICT must recognise that learning can be based on individual discovery and interpretation of knowledge. This awareness

would enable the teacher stress student participation and involvement to join creativity and build 21st-century citizens (Ghavifekr & Rosdy, 2015; Murithi & Yoo, 2021). Second, Vygotsky's social constructivism stresses collaboration over individual learning (Mcleod, 2023).

The constructivist approach holds that students can build knowledge from their environment instead of the teacher (Mcleod, 2023). Constructivism has a complementary relationship with technology, both benefit from each other. Technology supports constructivist learning. Students spend more time in active construction of knowledge when technology is involved in learning. Students actually learn more and in less time with computer-based instruction. This idea places the learner as the centre of knowledge.

2.2.2 Application of the Theory

The theory helps students understand subjects by sharing experiences and forming a shared understanding. In this case, the teacher has to foster cooperation, democracy, and shared content creation to give students a sense of ownership of knowledge. The theory is important for this study because it engages, explores, explains, elaborates, and evaluates how learning relates to the objectives. Another importance of this theory is that it enables teachers to assist collaborative learning through device sharing in low-resource contexts where ICT facilities may not be enough for all students.

The theory focuses on individual experiences and the role of active, creative and productive learning with the use of ICT facilities. Also, the implementation of

learning increases understanding, makes learners more creative and productive through meaningful learning process under this approach (Nurpatri et al., 2021).

2.2.3 Limitation of the Theory

The limitation of the theory is on the time required during implementation where by working under the constructivist framework, instructors are expected to spend more time engaging with the learner. In order to engage the learner, the teachers need to spend more time in preparation out of the classroom thinking about new activities (Brau, 2020). The theory also can create distraction for students especially when having technology around might be distracting, there is a possibility of cheating as cheating may be easier due to technology, reliability of resources, and replacement to real teachers.

2.3. Empirical Literature

2.3.1 The Availability of ICT Facilities, for Integrating Technology in Implementation of the Competency-Based Curriculum

Yamtinah et al. (2022), examined the perspectives of secondary school teachers regarding the opportunities and challenges associated with the adoption of Assessment Competency Minimum (AKM) in Indonesia. The study aimed to analyse perceptions of teachers related to the opportunities and challenges of implementing AKM in secondary schools. The study was mixed approach in nature. A total of 66 respondents involved in this study, and were selected through random sampling. Questionnaires instruments used to collect data. The data obtained were analysed qualitatively and quantitatively. The findings of this research indicate that a significant proportion of scientific educators hold the view that AKM policy is

reasonable and fits for execution. However, students' and instructors' ICT literacy and lack of ICT facilities support are regarded as obstacles that must be overcome. To ensure the quality and accessibility of ICT resources, the author suggests that this policy subsidises the building and maintenance of ICT infrastructure in rural and distant areas in particular, in a sustainable and adequate manner. Therefore, it seems that lack of ICT facilities is a problem in integration of ICT that is why the researcher needs to assess its availability specific to the context of Moshi Municipality.

A study conducted by Zeng, (2022) to investigate China's policy for the integration of ICT in basic education from 1988 to 2021. Mixed-methods research was used that combines bibliometric-based and content analysis for discovering policy patterns and development, 179 policy documents was selected from official website**.** The findings show that the availability and quality of ICT resources. The policy should specify enough and stable financial support for the development and keeping of ICT infrastructure, with a particular emphasis on rural and isolated regions. In addition, the policy should support teachers' and students' effective use of high-quality digital learning resources that are developed and shared in accordance with curriculum standards and student needs. I acknowledge the study for providing a basis knowledge that support the need of ICT facilities for integrating ICT in implementation of CBC in Moshi Municipality.

Murithi and Yoo, (2021) conducted a study in Kenya public elementary school, teachers' ICT competency-based curriculum implementation. The study aimed to assess school ICT facilities, teacher technology integration, and teacher technology

attitudes. Constructivist learning and the Technology Acceptance Model are used. Online surveys were completed by 351 instructors. However, Sub-Saharan African studies have revealed many hurdles to ICT integration into the curriculum.Therefore, the results showed that schools' ICT facilities were inadequate, making new curricular technology integration difficult. Most teachers had basic computer literacy training. Teachers were found struggling to incorporate technology into lessons despite lacking computers.inferential statistics was used to investigate teachers, capacity through Welch tests and Games Howell post hoc comparisons explored age and gender effects .Teachers in their 40s felt more useful than those in their 30s. More research is needed on 30s and 40s teachers' technology use perspectives and how gender influences teacher capacity and perception. This study was done outside of Tanzania. Therefore, there is a need of conducting the similar study in Tanzania specifically in Moshi Municipality.

Mbawala, (2023) conducted a study on the use and challenges of ICT for primary schools in Ilala district Tanzania. The study aimed to investigate teachers' understanding and knowledge of using ICT and its integration in the classroom, also the challenges facing them during implementation. The study was quantitative in nature. The targeted population was 150 teachers from five primary schools where 108 respondents were involved in this study, and were selected through simple random. Questionnaires as an instrument were used to collect data and data were analysed through descriptive. The findings show that inadequate availability of ICT devices, undependable internet connectivity, inadequate technical support, and the absence of professional training programmes were recognised as limitations to the

process. the study recommended that individuals, school administrators, and the government should ensure positive integration of ICT in education. Based on these findings there was a need to conduct the study for providing a basic knowledge that support the need of ICT facilities for integrating ICT in implementation of CBC especially in public primary school in Moshi Municipality.

A study was undertaken by Stephen, (2022) to examine the various elements that contribute to the successful implementation of competency-based education and training in Mbeya region. One mediating variable in this context was information and communication technology (ICT). Positivistic paradigm was applied with causal-effect research design. Targeted population was 1200 where cluster sampling was used to select 300 respondents. The instrument used by the researcher was questionnaires. The study identified several determinants that contribute to the successful execution of CBET: resource accessibility, training quality, ICT utilisation, and stakeholder engagement. The study suggests that in order to facilitate the adoption of CBET, the government should allocate sufficient resources to assist its implementation. Additionally, it is recommended that educational institutions utilise ICT to guarantee high-quality instruction and efficient utilisation. Therefore, ICT facilities was determined as factors that hinder implementation of CBET. Therefore, the researcher focused on the availability of ICT facilities in integrating ICT in the implementation of CBC for public primary schools in Moshi Municipality.

Based on the studies conducted by (Ghavifekr et al. 2014; Rutayuga, 2014;Van Noy, 2014;UNESCO ,2011 & 2018; Fengchun & Nanaieva, 2015 and Shepova, 2014), it was found that effective use of ICT resources in a teaching-learning process produces appropriate and desired to learn experiences, which results in effective and meaningful learning within the CBC. Some studies revealed that due to the lack of ICT facilities required to assist CBC activities in integrating technology teacher's fail to incorporate ICT in teaching and learning process (Yamtinah et al. 2022; Zeng,2022; Mbawala, 2023; Murithi&Yoo,2021; Stephen, 2022). Due to the important role which ICT has in this digital era, the absence of it makes the implementation of CBC difficult in schools. Hence, there was a need of checking out the availability of ICT facilities used to integrate ICT in implementation of competency-based curriculum specific for public primary school in Moshi Municipality.

2.3.2 Teachers' Perception to Integrate Technology into their Lessons in Implementing the Competency-Based Curriculum

A study was undertaken by Ishaq, (2023) to examine Teachers' perception of ICT integration in teaching and learning at primary level in Tehsil Kamalia District Toba Tek Singh. Quantitative survey method was used, where by random sampling was used to select 70 respondents from 35 public primary school out of 51. The instrument used to collect data was questionnaires. Data were analysed through descriptive and inferential statistics methods under the help of SPSS software. The study identified ICT facilities as one of the core factors for successful technology in education. Also, the results showed that teachers had strong awareness of ICT

integration in teaching and learning practices. Slow internet speed, load shedding, absence of infrastructures and online teaching experience and training were identified as the main factors that were preventing teachers from effective ICT integration in teaching and learning practices. The study recommended for further study on considering other aspects of ICT integration in terms of tactical planning and policy making. The study was conducted outside Tanzania hence, there was a need to do the same study in Tanzania specifically in Moshi Municipality**.**

Agyei, (2021) conducted a study in Kenya, Tanzania, Uganda, Ethiopia, Ghana, and Nigeria, countries found in Sub-Saharan Africa. This study aimed to evaluate the impact of the ICT- instructional professional development programme in relation to the quality and the extent of the teachers**'** transfer of the programme's ideas from capacity building to classroom instructional practices. The study employed mixed methods accompanied with embedded mixed method research design. A semi-structured survey instrument and diaries were used to collect data. A total of 4945 respondents from all countries were involved in the study. The findings show that teachers were generally satisfied with the programme's content and techniques, but implementation conditions were not appropriate to transfer training concepts to the classroom level because of lacking professional development in ICT integration into curriculum practices. The author recommended that efforts of integrating ICT through professional development (PD) programme were crucial to increase ICT-based teaching and learning. The study showed the situation after implementation of CBC three years ago and the teachers' perception on integration of ICT specifically in Moshi Municipality at the present.

Nkya, (2021) conducted a study on the Implementation of Competence Based Curriculum; Perceptions, Challenges and Prospects of teachers in Arusha region. This study aimed to investigate teachers' perception on the implementation of competence-based curriculum (CBC) in secondary schools. Mixed approach and cross-sectional survey research and case study design were used. Random and purposive sampling were used to select 248 respondents. questionnaire and interview schedule instruments were employed in data collection. Quantitative data were analysed through SPSS and thematic content was used to analyse qualitative data. The findings from the study showed that teachers had positive perception on the shift of curriculum from content-based to competence-based approach. However, about more than 70% didn't attend in-service training results on majority of them were less capable of implementing competence-based curriculum. More than 60% of the teachers failed to prepare teaching and learning activities as required by the CBC. Teachers also said that it was harder to use a competence-based curriculum when there were too many students in the class and not enough books and lab equipment. The study suggests that regular training for in-service teachers should be continued to make their skills, knowledge, attitude, and values up to date. This will help them use CBC effectively. This study focused on teachers' perception on implementing CBC for secondary schools in Arusha region. In contrast, the current study focused on teachers' perception in integrating ICT into CBC for public primary school in Moshi Municipality.

Tandika and Ndijuye, (2019) examined Tanzanian pre-primary teachers' readiness to integrate ICT into teaching and learning in Dodoma region. This research looked at pre-primary teachers' readiness to use ICT in the classroom and the obstacles they

were confronting in using it for meaningful learning. This study was done in Tanzania, where a qualitative transcendental phenomenological technique was utilised to assess teachers' ICT readiness in PPE. This survey selected 14 schools with 28 teachers. Semi-structured interview and open-ended questionnaires were used to collect data, and data content analysis procedures were used to analyse the collected data. The findings showed that Tanzanian pre-primary teachers were unprepared to use ICT in the classroom. Teachers were also facing infrastructure, training, and resource issues when integrating ICT into teaching and learning process. Hence there was a need for a study with a similar theme to be conducted in public primary school's context especially in Moshi Municipality.

Some studies conducted by (Agyei, 2021; Ishaq, 2023) indicated that most of the teachers had positive perception on integration of ICT into competence-based curriculum which enabled effective and successful ICT integration in teaching and learning practice. Also, other studies revealed that teachers had negative perception on ICT due to lack of training and facilities in integrating ICT as a core competence in implementing CBC (Nkya, 2021; Tandika and Ndijuye, 2019). Due to the important role of ICT into CBC implementation, positive perception, skills and attitude of teachers are important factors for successful ICT integration. Hence, there was a need of examining teachers' perception in integration of ICT in their lessons specifically in Moshi Municipality.

2.3.3 Challenges for Integrating ICT into Implementation of a Competency-Based Curriculum

Seifu,(2020) carried out a study on the determinants of ICT integration in teaching-

learning process at Aksum University in USA. **T**he purpose of this study was to investigate the factors that determine the integration of Information and Communication Technology (ICT) in the teaching-learning process. Descriptive survey research design was used. Targeted population was 555 where 390 respondents were selected as samples by using stratified random sampling and comprehensive sampling techniques, respectively. Questionnaires and interview were used to collect the data. The results showed that teachers' attitudes toward using ICT, the availability of ICT facilities, teachers' confidence in their own abilities, teachers' technology knowledge, and the nature of the technology; all had a big impact on how well ICT was integrated. On the other hand, teachers' lack of administrative and technical support, the strict nature of the curriculum, not having enough time or electricity, and not having any concrete examples of how to integrate technologies, all made it difficult to use ICT in the teaching and learning process. This study was done in a developed country but which showed that there were so many challenges that were hindering ICT integration. Based on this study there was a need of checking how the situation was in a developing country like Tanzania, specifically in Moshi Municipality.

Nombo, (2022) conducted a study on competency-based curriculum in the teacher's colleges in Rukwa region. The purpose of this study was to examine the challenges teachers' colleges were facing in teaching with competence-based approach (CBA). Mixed- research approach was used. Classroom observation, interviews and open-ended questions from questionnaires were given to 64 respondents. The statistical package for social sciences (SPSS) was used to analyse quantitative data, and content

analysis was used for qualitative data. The findings showed various challenges facing teachers in teaching and integrating CBC which included: poor government support, shortage of teaching and learning materials, poor infrastructures, shortage of training opportunities for professional development and lack of follow up activities from the curriculum planners. The study found that colleges were not training teachers for effective CBC implementation in schools due to the above obstacles. The study focused on challenges facing teachers when implementing CBC in colleges and not public primary schools specific in Moshi Municipality.

The study conducted by Simbeye, (2020) evaluated the integration of ICT in the teaching and learning process in the selected secondary schools in Morogoro, Tanzania. The research specifically evaluated the common aspects of teaching and learning in secondary schools where ICT was primarily utilised, evaluated the availability of ICT facilities in the selected schools, and evaluated the integration of ICT in teaching and learning. It also identified the challenges associated with ICT integration in teaching and learning and the successes that resulted from this integration. The study employed a qualitative methodology for the investigation. It utilised in-depth interviews, focused group discussions, documentary analysis, and observation to obtain data from a sample of 163 respondents. The data collected for the study were analysed using content analysis, which was judged to be appropriate. The results suggested that the integration of ICT in secondary schools was low as a result of a lack of desire, inadequate resources, inadequate ICT knowledge and skills among instructors, and poor management support. The study suggested that further measures should be taken to guarantee the incorporation of ICT in the teaching and

learning process. To enhance the level of ICT integration in secondary schools, it was necessary for school owners, as well as the government, to provide additional ICT facilities, provide supportive ICT infrastructure, and give teachers training on how to utilise the technology. In order to ensure effective implementation, the policy should also explicitly address the concerns of ICT integration in schools. Nevertheless, the investigation was conducted in a secondary school; hence, it was imperative to implement comparable investigations in public primary schools, particularly those located in Moshi Municipality.

2.4. Synthesis and Knowledge Gap

Some gaps in the literature have been revealed by the literature review. Numerous studies have been conducted to examine the integration of ICT into the implementation of competence-based curriculum. These studies focused on the availability of ICT facilities, skills, attitude, and readiness of teachers to integrate ICT, the factors or elements that contribute to and affect the integration of ICT and the implementation of competence-based curriculum, the perceptions, preparedness, and professional development of teachers regarding ICT integration, and the opportunities and challenges presented by ICT integration in education. The research undertaken in Tanzania primarily concentrated on the use, preparation of instructors, impacts, and obstacles of incorporating ICT into the teaching and learning process in secondary, pre-primary, school, and teachers' colleges. For instance (Simbeye, 2020; Nombo, 2022; Tandika and Ndijuye,2019 and Mbawala, 2023). Nevertheless, there is a scarcity of research that has been undertaken to determine the efficacy of the integration of ICT into the competence-based curriculum in public primary schools

in Tanzania in terms of the provision of quality education. Nevertheless, a substantial period of time has elapsed since the implementation of CBC in Tanzania started, and it is uncertain whether the integration of ICT is effective. Or whether it has resulted in students with low academic knowledge, skills, values, and ability in ICT. Therefore, this investigation endeavoured to address the gap by assessing the integration of ICT into the implementation of CBC in public primary schools in Moshi Municipality, Tanzania.

2.5 Conceptual Framework

The conceptual framework below shows the relationship between the independent and dependent variables that guided this study.

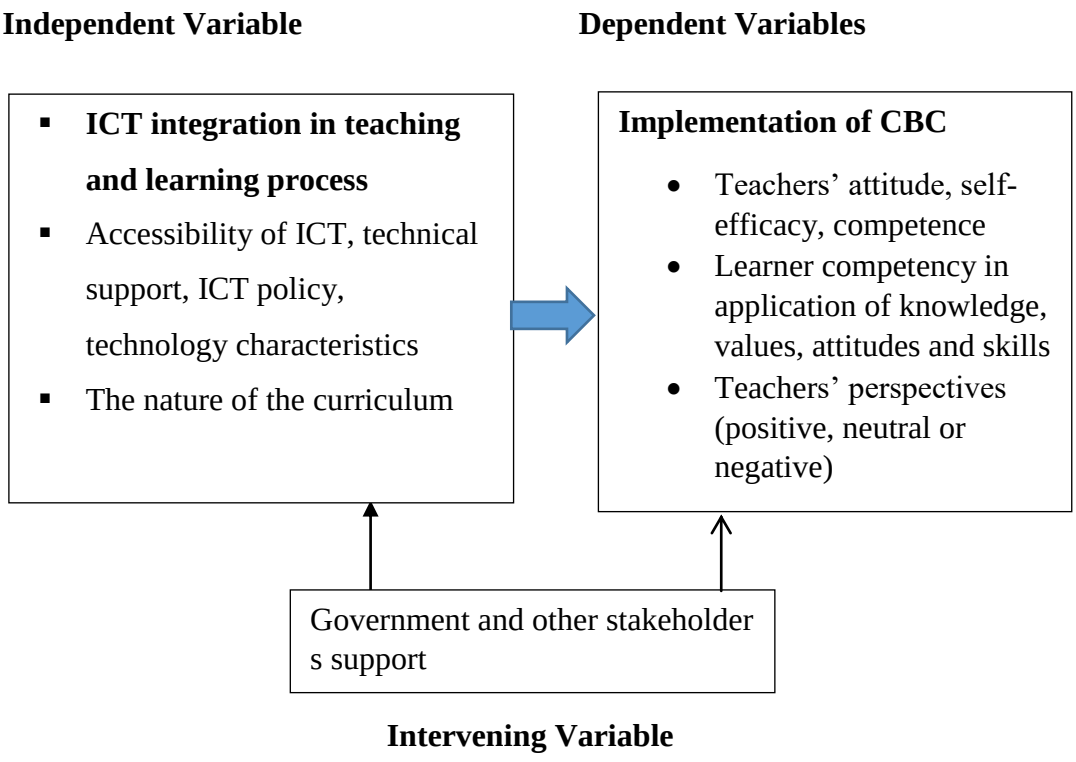

Figure 2. 1: The Conceptual Framework that Guided this Study

Source: Modified from (CIPP) model of evaluation proposed by Stufflebeam (1971).

The integration of Information and Communication Technology (ICT) plays a crucial role in the effective implementation of a Competency-Based Curriculum (CBC). ICT enhances CBC by providing digital resources that facilitate interactive learning, personalized instruction, real-time assessment, and collaboration between students and teachers. Government funding and resource support, including investments in technological infrastructure, teacher training, and digital tools, significantly impact the success of ICT integration within the CBC framework.

As an intervening factor, government and stakeholder support are essential in facilitating and strengthening the relationship between ICT integration and CBC implementation. Policy frameworks that promote technology adoption in education create an enabling environment for effective curriculum delivery. Strong institutional backing fosters innovative applications of ICT, ultimately improving the quality of CBC execution.

Furthermore, successful ICT integration can enhance educational outcomes, encouraging continued government and stakeholder investment in digital learning initiatives. A well-designed curriculum that strategically incorporates ICT supports the development of innovative teaching methodologies, authentic assessments, and personalized learning experiences. This, in turn, equips students with the essential skills needed to thrive in the digital era.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research methodology for the study. It describes a brief presentation of the research paradigm, research methodology approach, study design, the study area, study population, sampling technique, and sample size are described in this section. Furthermore, this part elucidates the approaches taken for data collecting, processing, and analysis, in addition to validity and reliability. Ethical considerations are further presented upon in this particular section.

3.2 Research Paradigm

This study employed pragmatism paradigm. Research paradigms area set of common beliefs and agreements shared by scientists on how problems can be understood and addressed (Kumatongo & Muzata, 2021)**.** The approach to this research involved philosophical assumptions as well as distinct methods that guided the researcher's methodological decisions in collecting information (data), analysing and interpreting them, and reporting the findings. Research design involves the intersection of philosophy, strategies of inquiry (qualitative strategies interview; quantitative strategies e.g., questionnaire), and specific methods (mixed methods e.g., successive). Thus, the researcher ought to think through pragmatism which is not committed to any sort of philosophical stand but it uses multiple methods which are always guided by the research problems (Dawadi et al., 2021). The reason of using pragmatism was because of its values for both objective and subjective knowledge which were expected to meet the research's objectives**.**

3.3 Research Approach

This study used mixed methodology approach that offers the opportunity to benefit from the strengths of both numerical and narrative data in the same study and presents a more holistic study of a research problem as it is confirmed by Jawabreh et al., (2023). Mixed research is not merely a combination of qualitative and quantitative designs, but it uses specific designs that allow the collection, analysis and interpretation of data (Creswell, 2021). This study used both qualitative and quantitative approaches where qualitative approach definitely covered issues in great depth and detail and allowed the interaction with the research subjects. Furthermore, quantitative approach enabled the researcher to collect data in terms of numbers for the purpose of testing and verifying theories (Mohajan, 2020).

3.4 Research Design

The convergent parallel design was used because it involves the collection of both quantitative and qualitative data simultaneously for the purpose of understanding the research problem (Dawadi et al., 2021).

3.5 Area of the Study

This study was conducted in Moshi Municipality, Tanzania. The Moshi Municipality was selected due to its proximity and availability of necessary facilities to conduct the study; such as number of best and high rated primary schools visa-vis environmental climate which is conducive for students to study. Moshi Municipality is located in Kilimanjaro region where most primary schools have demonstrated the willingness of using ICT in implementing CBC in their teaching and learning.

3.6 Targeted Population

The Population of this study was 798 containing 793 teachers and heads of schools from 37 public primary schools and 5 quality assurance officers.

3.7 Sample and Sampling Techniques

3.7.1 Sampling Techniques

The researcher used purposive sampling to select key respondents because according to Mweshi and Sakyi, (2020), purposive sampling allows the researcher to apply the best sample according to the purpose of the study. Purposive sample in the context of this study involved 20 heads of schools and 1 quality assurance officer who was sampled according to their unique character.

In addition, the study used simple random sampling technique to select 245 teachers from 20 public primary schools. According to Lakens, (2022) simple random sampling enables the researcher to ensure that each member of the target population has an equal and independent chance of being included in the sample.

3.7.2 Sample Size

Sample size is a small group of respondents drawn from a population in which the researcher is interested in gaining information and drawing conclusions (Okendo et al., 2020). It is exact number of the respondents or items which participate in the study. The sample size of this study was 266 respondents. The sample size was obtained from Slovin's Formula 1960 as shown below:

n =N/1+Ne^{2}where n =sample size, N= population size, e^2 = margin error (0.05)

$$n = 798/1 + 798(0.05 \times 0.05) =$$

Hence n=266

The sample size (266) respondents included (245 teachers from 20 public primary schools, 20 heads of school and 1 quality assurance officer). The researcher decided to select randomly 20 primary schools because of willingness and readiness of the respondents to respond accordingly. Meanwhile, gender and working experience of the respondents were considered while selecting the sample size in each category.

3.8 Methods of Data Collection

This is the methodical process of collecting and analysing exact information to give solutions to the relevant questions and evaluate the results (Okendo et al., 2020). The study collected primary data through questionnaire administration and interviews using semi-structured interview guide.

3.8.1 Questionnaire

This is an instrument used to collect quantitative data which involves a series of questions and convinces individuals to provide response for the current study (Okendo et al., 2020). The study applied close-ended questionnaire type because it enabled the researcher to collect data from a large group of the respondents. This study used a Likert Scale type of questions to obtain information about the respondents' perception regarding the use of ICT facilities in CBC.

3.8.2 In-depth Interview

The in-depth interview enables the researcher to ask some key questions about the

subject and also gives the interviewer and interviewee room to go off on tangents to dig deeper into an issue or answer (Rutledge & Hogg, 2020). Also, it lets both the interviewer and the person being interviewed talk to each other (Islam & Aldaihani, 2022). The researcher used this method to collect the qualitative data by making sure that the issue being studied was properly handled during the interview. Hence in-depth interview questions were used to get more detailed information about the research topic or issue.

3.9 Validity and Reliability

3.9.1 Validity of the Research Instruments

Validity refers to whether the research method used in the research measures what the researcher has intended it to measure (Sürücü& Maslakçi, 2020). In this study, validity was ensured by asking a panel of experts e.g., supervisors to examine clarity, relevant items and to check ambiguities in the tools. Similarly, the researcher used multiple data collection methods to enhance the validity of the instruments.

3.9.2 Reliability of the Research Instruments

According to Ross, (2019) reliability is a determination of how consistently a measure assesses an outcome. A measure is reliable when it is consistent. Research reliability means how similar the results would be if another researcher conducted the same research in another place and time. If the acquired results are similar, the research can be said to be reliable.

In this study, it could be easy to get the same results if the data collection process would be repeated by another researcher in another place and time. Under the study,

with regard to the questionnaire, most of the questions were closed ended questions to ensure reliability. Also, the Cronbach Alpha was calculated to ensure reliability, where the Cronbach Alpha was used to measure internal consistency of instruments where there are no right or wrong answers (Okendo et al., 2020). Therefore, to determine the validity and reliability of the research instruments, the researcher employed content validity and Cronbach's Alpha (with a reliability coefficient of 0.7) respectively.

3.10 Data Processing and Analysis

According to Okendo et al., (2020), data analysis is the process of classifying, gathering, using, summarising data to obtain answers from the research questions. The researcher analysed both qualitative and quantitative data as follows.

Qualitative data analysis refers the categorisation and interpretation of linguistic (or visual) content in order to derive conclusions regarding the material's implicit and explicit meaning-making processes and dimensions, as well as its representations (Mezmir, 2020). Since this study used in-depth interview, the researcher analysed, interpreted, categorised and classified qualitative data through coding and identification of themes or patterns. Three steps were followed, that is, reduction of data by choosing the item of analysis, combining a large number of texts into fewer groups (i.e., creating categories). Finally, the establishment of the themes was linked with the essential meaning of category.

Under quantitative data from questionnaires, data were analysed with descriptive statistics and summarised into frequency, percentages distributions and charts or

graph, tables with the help of Statistical Package for Social Sciences (SPSS) for easy interpretation.

3.11 Ethical Considerations

The ethical behaviour in research incorporates good manners that a researcher needs to observe when conducting a study. The following are the ethical behaviours followed by the researcher while in the field; being open and honest, fully explained about the research in advance to the subject and afterward; the researcher maintained the confidentiality at all time. Also, the researcher got the permission letter from the Open University of Tanzania and addressed the research clearance letter to the District Executive Director, then the District Administrative Secretary wrote a letter to introduce the researcher to the head of Division for pre-primary and primary Education. Finally, she wrote a letter to introduce the researcher to the educational officers, heads of school and classroom teachers. Also, the respondents were informed in advance on the purpose of the study and were assured that the confidentiality would be maintained, and information collected would be used for academic purposes and not otherwise.

The researcher followed the guiding principles of research such as acknowledgement of sources of published information to avoid plagiarism. The study also avoided bias by reporting facts as reviewed from the collected data.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter presents the main findings of the study in order of the objectives. The quantitative findings are immediately triangulated with qualitative findings for easy synthesis.

4.2 Socio-Demographic Characteristics

A total of 245 primary school teachers participated in the study. Majority were females (55.1%). More than one-third were in the age group of 25-34 years (33.9%) and 35-44 years (40.4%). About 38% were either holders of certificate or diploma (38.0 and 38.4% respectively). More than one-third (36.3%) had been in the teaching profession for a duration of between 6 and 10 years. This implies that majority of the teachers had enough experience in implementing Competence-based curriculum since it was introduced in 2016 and all gender were considered in this study (Table 4.1).

Table 4.1 : Socio-Demographic Characteristics of the Teachers (n=245)

Variable	Frequency (%)
Gender:	
Male	110 (44.9)
Female	135 (55.1)
Age group (years):	
15-24	11 (4.5)
25-34	83 (33.9)
35-44	99 (40.4)
45-54	44 (18.0)
55-64	7 (2.9)
Above 64	1 (0.4)
Level of professional qualifications:	
Certificate	94 (38.4)
Diploma	93 (38.0)
Undergraduate degree	48 (19.6)
Postgraduate	10 (4.1)
Duration in teaching (years)	
1-2	10 (4.1)
3-5	16 (6.5)
6-10	89 (36.3)
11-15	53 (21.6)
16-20	38 (15.5)
Above 20	39 (15.9)

Table 4.2 shows the distribution of the demographic characteristics of the participants in in-depth interviews. Twenty-one participants participated in the in-depth interviews. Majority were males (52.4%), heads of primary schools (95.2%), undergraduates (71.4%) and with working experience of 16-20 years (57.1%). This also implies that educators were well experienced with the implementation of CBC with the core competence of ICT integration. The results are presented in Table 4.2.

Table 4.2 : Demographic Characteristics of in-Depth Interview the Participants (n=21)

Variable	Attribute	Frequency	Percent
Gender:			
	Female	10	47.6
	Male	11	52.4
Designation:			
	Head of school	20	95.2
	DSQAO	1	4.8
Professional qualifications:			
	Diploma	3	14.3
	Undergraduate degree	15	71.4
	Postgraduate	3	14.3
Working experience (years):			
	6-10	3	14.3
	11-15	3	14.3
	16-20	12	57.1
	Above 20	3	14.3

DSQAO = District School Quality Assurance Officer

4.3 Availability of ICT Facilities for Implementing the Competency-Based Curriculum

4.3.1 Availability of ICT Facilities

Figure 4.2 shows the distribution of availability of the ICT facilities to the study participants. Majority of the participants had the following ICT facilities available: mobile devices (smartphone) with Internet access and e-mail functionality (75.5%), laptops (67.3%), mobile device (tablet) with Internet access and e-mail functionality (61.6%) and desktop computers (60.4%). ICT facilities were mentioned to be available to a less extent to the study participants. These were reliable Internet connection (Wi-Fi,3G/4G or local area network) where it was mentioned to be available by less than 34% of the participants. This implies that ICT facilities is not

enough for effective ICT integration. This was supported by Mbawala, (2023) that, inadequate availability of ICT devices, unreliable internet connectivity, inadequate technical support, and absence of professional training programmes were recognised as limitations to the integration of ICT in teaching and learning process.

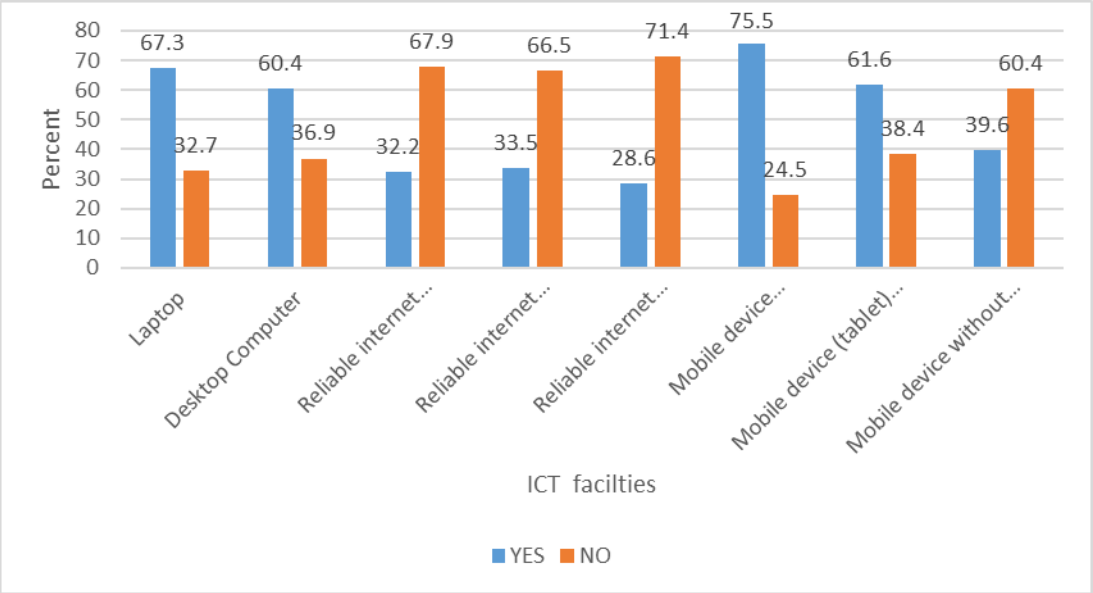

Figure 4. 1 : Availability of ICT Facilities (n=245)

4.3.2 Level of Experience in the use of ICT Facilities

The respondents were asked to indicate their level of experience in the use of ICT facilities. Majority (>50%) of the respondents felt that they were either experienced or well experienced in the use of computers and Internet. Less than 40% of the respondents were experienced or well experienced in the use of word processing software (39.2%), e-learning platforms (38.8%), spreadsheets (37.6%), overhead projector and use of digital technologies to teach (35.1% respectively), power point (30.6%) and data projector (26.5%).This means that majority of the teachers had

minimal experience in using digital device and software on integrating ICT into their lesson, this was cemented by Tandika and Ndijuye, (2019) that, Tanzanian pre-primary teachers were unprepared to use ICT in the classroom. Teachers were also facing inadequate ICT infrastructures, ICT training, and resource issues when integrating ICT into teaching and learning process as presented in Table 4.3.

Table 4.3 : Level of Experience in the use of ICT Facilities (n=245)

Please indicate your experience with:	Well Experienced Freq. (%)	Experienced Freq. (%)	Neutral Freq. (%)	Not Experienced Freq. (%)	Not Experienced at all Freq. (%)
Computers	39 (15.9)	90 (36.7)	83 (33.9)	21 (8.6)	12 (4.9)
Internet	34 (13.9)	95 (38.8)	79 (32.2)	28 (11.4)	9 (3.7)
e-learning platform (e.g. Blackboard, Moodle etc.)	34 (13.9)	72 (24.9)	75 (30.4)	54 (22.0)	10 (4.1)
Overhead Projector	20 (8.2)	66 (26.9)	72 (29.4)	72 (29.4)	15 (6.1)
Word processor	23 (9.4)	73 (29.8)	63 (25.7)	69 (28.2)	17 (6.9)
Spreadsheets [Excel]	23 (9.4)	69 (28.2)	75 (30.6)	60 (24.5)	18 (7.3)
Experience using digital technologies to teach	23 (9.4)	63 (25.7)	93 (38.0)	46 (18.8)	20 (8.2)
PowerPoint	17 (6.9)	58 (23.7)	67 (27.3)	69 (28.2)	34 (13.9)
Data Projector	16 (6.5)	49 (20.0)	10 (4.0)	103 (42.0)	67 (27.3)

On the other hand, in-depth interviews, majority (19/21) mentioned inadequacy of ICT facilities in schools such as desktop computers and most of the available laptops were owned by the teachers themselves for doing their own work as narrated by one of the participants:

> *"No, the implementation is not in good because teachers lack enough computers for students to learn practically. For example, most of the science and technology teachers fail to teach some topics (internet, word processor, spread sheets etc.)."* [R3,2024]

4.4 Teachers' Perception in Integrating ICT into their Lessons in Implementing the Competency-Based Curriculum in Public Primary Schools

4.4.1 Teachers' Perceptions on the Importance of Qualities for Successful Incorporating of ICT into the Classroom

Respondents were asked to indicate the level of importance of qualities required for the successful incorporation of ICT in the classroom. It was found that more than 90% of the teachers were of the opinion that all probed requirements on the importance of incorporating ICT into the classroom were either important or most important. The proportion of teachers ranged from 92.3% on policy to 98.4% on skills. This implies that, teachers had positive perception on ICT integration but they needed to be well skilled, trained and supported for successful incorporation of ICT in the classroom. Also, this was identified by Nombo, 2022) that teachers were facing various challenges in teaching and integrating ICT. These challenges included: poor government support, shortage of teaching and learning materials, poor infrastructures, shortage of training opportunities for professional development and lack of follow up activities from the curriculum planners for successful CBC implementation. These findings are related with those of Seifu, (2020) who showed that teachers' attitudes toward using ICT, the availability of ICT facilities, teachers' confidence in their own abilities, teachers' technology knowledge, and the nature of the technology all had a big impact on how well ICT was integrated. On the other hand, teachers' lack of administrative and technical support, the strict nature of the curriculum, not having enough time or electricity, and not having any concrete examples of how to integrate technologies all made it difficult to use ICT in the teaching and learning process. Furthermore, these findings align with Zeng (2022)

who found that regarding the availability and quality of ICT resources, the policy should specify enough and stable financial support for the development and keep of ICT infrastructure, with a particular emphasis on rural and isolated regions. These findings are illustrated in Table 4.4 below.

Table 4.4 : Required Qualities for Successful Incorporation of ICT in the Classroom

Qualities for succeeding in ICT integration	Rating of importance				
	Most Important	Important	Neutral	Least Important	Not Important at all
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Skills	194 (79.2)	47(19.2)	4 (1.6)	0 (0.0)	0 (0.0)
Confidence	168 (68.6)	63 (27.3)	10 (4.1)	4 (1.6)	0 (0.0)
Attitude	152 (62.0)	80 (32.7)	12 (4.9)	1 (0.4)	0 (0.0)
Training	168 (68.6)	65 (26.5)	10 (4.1)	2 (0.8)	0 (0.0)
Support	160 (65.3)	74 (30.2)	10 (4.1)	1 (0.4)	0 (0.0)
Policy	154 (62.9)	72 (29.4)	17 (6.9)	2 (0.8)	0 (0.0)
Curriculum	172 (70.2)	58(23.7)	11 (4.5)	3 (1.2)	1 (0.4)

4.4.2 Required Personal Professional Development Needs

Respondents were asked to specify the level of need on personal professional development for facilitating the incorporation of ICT in implementing CBC in primary schools. More than 64% of the respondents perceived that all probed professional needs were needed at a high-level ranging from use of ICT for assessment (64.1%) to use of ICT in teaching (76.3%). Less than 3% of the respondents rated the probed items as not needed at all (Table 4.5).This implies that integration of ICT for effective implementation of competence based curriculum depends on professional development training as reviewed by Agyei, (2021) that

teachers were generally satisfied with the programme's content and techniques, but implementation conditions were not appropriate to transfer training concepts to the classroom level because of lacking professional development in ICT integration into the curriculum practices.

Table 4.5 : Professional Development Needs (n=245)

Professional Development Needs	Ranking			
	HLN	**MLN**	**LLN**	**NLN**
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Use of ICT in teaching	187 (76.3)	37 (15.1)	14 (5.7)	7 (2.9)
Selection of ICT resources appropriate for teaching	179 (73.1)	53 (21.6)	8 (3.3)	5 (2.0)
Use of ICT for assessment	157 (64.1)	70 (28.6)	16 (6.5)	2 (0.8)
Knowledge and understanding of using ICT in the teacher's specific subject(s)	171 (69.8)	51 (20.8)	16 (6.5)	7 (2.9)
Technological pedagogical knowledge	158 (64.5)	67 (27.3)	16 (6.5)	4 (1.6)
Use of ICT for administrative purposes	170 (69.4)	58 (23.7)	12 (4.9)	5 (2.0)
Use of ICT as a depository data tool	162 (66.1)	67 (27.3)	14 (5.7)	2 (0.8)
ICT integration into the classroom	173 (70.6)	57 (23.3)	12 (4.9)	3 (1.2)
Development of ICT skills in a particular context	169 (69.0)	58 (23.7)	15 (6.1)	3 (1.2)

HLN= High level of need, MNL= Moderate level of need, LLN= Low level of need
NLN= No need at all

Similar to that, during in-depth interviews, participants were of the opinion that workshops and seminars were a more effective way of increasing knowledge and

confidence to teachers to make them comfortable in implementing the integration of ICT in competence-based curriculum as mentioned below:

> "*Workshop and seminars for effective ICT use are very important because they give teachers more confidence, increase their knowledge from those who know and they make them comfortable in using ICT in teaching and the learning process.*" [R8, 2024]

4.4.3 Personal Experience with ICT Use

Respondents were asked to rank their level of agreement on statements pertaining to experience with ICT. More than 60% of the respondents either agreed or strongly agreed on all statements ranging from 60.8% for the statement: "I' am comfortable instructing using resources from the internet" to 77.5% for the statement "I feel confident using the internet to search for extra materials". Table 4.6 shows the results.

Table 4.6 : Level of Agreement on Experience with ICT (n=245)

Aspects of confidence	Rating of level of agreement				
	SA	A	N	D	SD
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
I am comfortable utilising e-learning platforms to improve ICT skills	73 (29.8)	101(41.2)	64(26.1)	6(2.4)	1(0.4)
I feel confident operating computers	54 (22.0)	102(46.1)	74(30.2)	14(5.7)	1(0.4)
I am comfortable instructing using resources from the internet.	50 (20.4)	99(40.4)	86(35.1)	9(3.7)	1(0.4)
I feel confident using ICTs as teaching tools	45 (18.1)	112(45.7)	76(31.0)	10(4.1)	2(0.8)
I am comfortable utilising ICT resources to improve my instruction.	47 (19.2)	121(49.4)	61(24.9)	13(5.3)	3(1.2)
I am comfortable utilising online resources to encourage engagement between learners and information.	53(21.6)	113(46.1)	67(27.3)	9(3.7)	3(1.2)
I feel confident using e-learning resources to promote teacher-learner interaction	46(18.8)	116(47.3)	67(27.3)	11(4.5)	5(2.0)
I feel confident using the internet to search for extra materials	65(26.5)	125(51.0)	44(17.9)	8(3.3)	3(1.2)
I feel confident using e-learning materials to teach	68(27.8)	94(38.4)	70(28.6	8(3.3)	5(2.0)

SA=Strong agree, A=Agree, N=Neutral, D=Disagree, SD=Strong disagree

On the other hand, results from in-depth interviews showed that most of the participants had positive perception on ICT integration that, ICT enables learners to be creative and makes learning easy as it is narrated below:

> *"Quality education depends on how ICT will be integrated, because it is the one which enables learners be creative, active and it facilitates easy learning"* [R11, 2024]

> "*ICT is the most important of the core competences in implementing CBC because it is the one which enables students to acquire the 21st century skills through active learning"* [R17, 2024]

4.5 Challenges in Integrating ICT in Implementation of CBC for Public Primary Schools

Respondents were asked to mention the challenges the were encountering in integrating ICT in the implementation of competence-based curriculum in primary schools. The prominent barrier mentioned by more than one-third (39.2%) of the respondents was inadequacy of ICT facilities followed by absence of digital infrastructure (32.2%). The least mentioned challenge was lack of technical and fund support (7.8%). However, 8.6% of the respondents mentioned all the challenges. This implies that ICT integration in most of the schools under the study was minimal due to different challenges that teachers were facing during teaching and learning practice. This was also identified by Ishaq, (2023) that ICT facilities were one of the core factors for successful technology in education. Again, the results showed that teachers had strong awareness of ICT integration in teaching and learning practices. Slow internet speed, load shedding, absence of infrastructures and online teaching experience and training were identified as the main factors that were preventing teachers from effectively integrating ICT in teaching and learning practices, as indicated in Figure 4.2.

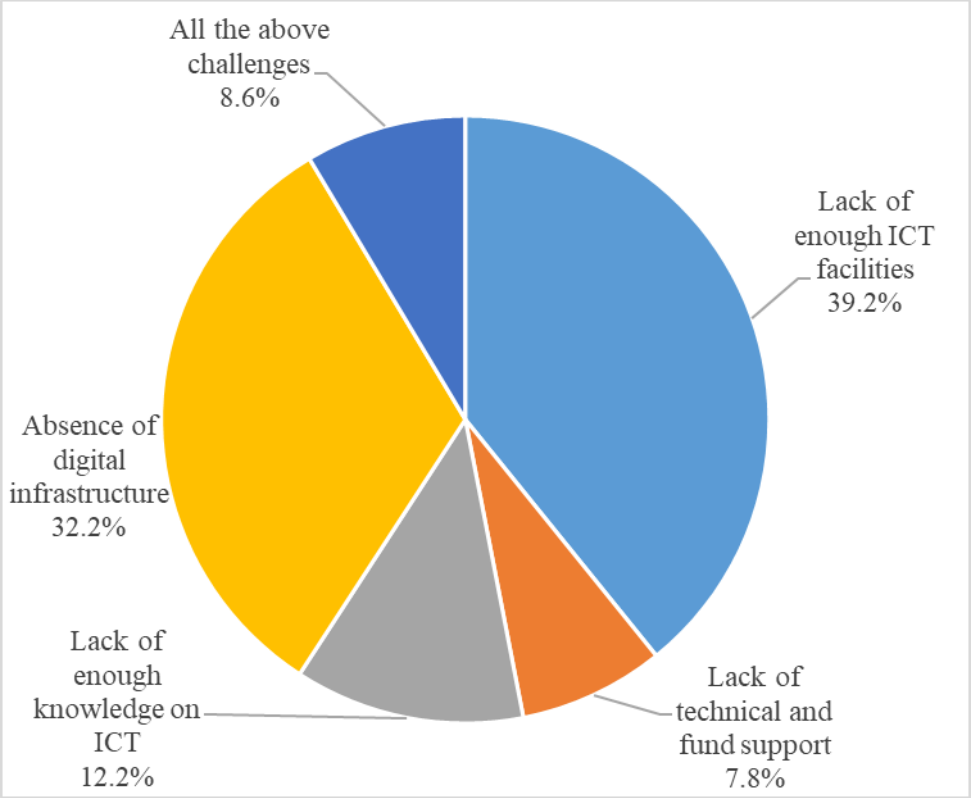

Figure 4. 2 : Challenges faced by Schools in Integrating ICT (n=245)

Likewise, most of the participants in in-depth interviews mentioned inadequacy of funds and technical support including frequent power cut-offs when it came to facilitating ICT integration in delivering CBC in primary schools. This was narrated by one of the participants:

> ***"****We have many challenges during ICT integration, for example, low facilities, lack of funds to support operations (internet, increasing some ICT resources), lack of technical support, power cut-off, poor infrastructures and some teachers are not well prepared on using ICT tools.****"*** [R9, 2024].

Also, the participants mentioned inadequacy of information technology (IT) literacy among teachers and lack of facilities to implement integration of ICT in delivering

CBC as mentioned by one of them *"Few of them are confident and comfortable in using ICT; about 75% are not using it because of low skills as well as lack of enough facilities."* [R21, 2024]

CHAPTER FIVE

DISCUSSION OF THE FINDINGS

5.1 Introduction

This chapter discusses the main findings of the study in order of the objectives. The findings are compared to the findings of other similar studies in similar settings. The reasons for divergence of findings are also speculated.

5.2 Availability of ICT Facilities in Implementing the Competency-Based Curriculum

Despite the fact that majority of the participants mentioned availability of mobile devices and laptops, most of these devices were personally owned by the teachers for their personal use. This was confirmed during in-depth interviews where the participants said that computers were not enough for teachers and students. This implies that the integration of ICT in the implementation of competence-based curriculum in public primary schools was not well done due to lack of enough intellectual and scientific materials. This is against the National ICT Policy ,2016 and the drafted National ICT Policy, 2023 both of which advocate for the application of ICT in all sectors by ensuring reliable, affordable, secure, interoperable, and sustainable digital facilities and infrastructures (URT,2023). The Tanzania Development Vision 2025 also puts a strong emphasis on advancing science and technology education by highlighting the use of ICT to develop the necessary competencies and skills and by allocating sufficient funding to raise the standard of science-based education and foster an educated populace (URT,2020).

This could foster the speed of ICT integration and hence improvement of the quality of education in primary schools and the attainment of Sustainable Development Goal 4 Target 4.1 by the year 2030. The inadequacy of ICT facilities in schools has also been reported in other similar studies. For, example, Murithi and Yoo (2021) in their study on the availability of ICT facilities in schools found that these facilities were inadequate for the technology integration in the curriculum. Also, Mwendwa (2017) in his study on the availability of resource materials and facilities for ICT integration in the public primary school curriculum in Kenya reported that many schools lacked ICT resources such as desktop computers and whiteboards. Also, it was shown that internet connectivity was a challenge that affected ICT integration in the curriculum.

Regarding information technology literacy, the study found that majority of the respondents felt that they were either experienced or well experienced in the use of computers and the Internet. However, less than 40% of the teachers were proficient in the use basic software such as word processors and spreadsheets and also e-learning platforms such as Moodle. Proficiency in the use of the commonly used software is a pre-requisite for the integration of ICT in the CBC. Also, this implies that ICT was not effectively integrated in the implementation of B.Ths. being the situation, the quality of education remained questionable. This is also supported by World Bank Report,2023 that recognised the inadequate skills and experience of teachers in using ICT in teaching and learning in Tanzania hence, advocated for improvement by putting emphasis on Learning Management System (LMS), e-learning library, ICT integration strategy, digital skills framework, and hub schools to effectively ensure adaptation in the classroom.

The finding that majority of the teachers reported to be experienced/well experienced with computers and Internet is supported by a study conducted by Murithi and Yoo (2021) in Kenya who indicated that most of the primary school teachers had basic computer literacy training. However, other studies have shown that teachers had poor skills and ineffective support on the use of basic ICT facilities including hardware, software, and associated peripherals (Kihoza et al., 2016; Simbeye, 2020).

5.3 Teachers' Perception in Integrating ICT into their Lessons in Implementing the CBC

Most of the teachers perceived that integrating ICT in the implementation of the CBC curriculum was important for delivering quality education. This could have been attributed by the fact that ICT simplifies their work in terms of search, preparation and storage of teaching materials; reduction of paperwork, chalkboard use; and evaluation process. This implies that teachers had positive perception on the ICT integration in the CBC and therefore the integration of ICT in teaching and learning process depends on the readiness and competence of the teacher in effective integration of ICT in schools and classrooms that can transform pedagogy and empower students with the 21stcentury skills. For example, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 2018 published the third updated version of the theoretical framework for the competences needed in the use of ICT among teachers' skills. In this regard, in order to guarantee learning fairness and quality, the teacher must possess the abilities necessary to incorporate ICT into their professional activity. The framework covering changes in education, curriculum alterations, pedagogy development, teacher development, school facility

organisation, and professional development (Tomczyk & Fedeli, 2021). These findings concur with studies by Ishaq et al., (2023) on teachers' perception of ICT integration in teaching and learning and Kalinga (2024) in his study on teachers' technological literacy for ICT integration to implement competence-based curriculum in public secondary schools in Tanzania. It was demonstrated that the teachers were positive about ICT integration in their teaching and learning practices. This finding is also supported by Mwendwa, (2017) in his study on the perception of teachers and principals on ICT integration in the primary school curriculum who reported that teachers and principals had positive perception on ICT integration. They were of the opinion that ICT was an important tool in improving performance, collaboration, learning experience and outcome. Also, it has been shown that ICT integration is very effective for both teachers and students. They stipulate that the use of ICT tools is one of the fundamental factors for successful technology-enabled teaching and learning.

Therefore, if the benefits of investing or integrating ICTs in the implementation of CBC are to be realised, positivity of the teachers'percetion would not be enough rather, teacher training and ongoing, relevant professional development are crucial. To guarantee that their pupils acquire the necessary skills, including digital competences for life and work, instructors must get ongoing training and assistance in order to acquire the requisite ICT competencies.

5.4 Challenges Encountered in Integrating ICT in Implementation of CBC

The study found that the main challenges facing the ICT integration in CBC in primary schools were lack of ICT facilities and inadequate digital infrastructure. This

was revealed by the questionnaire provided to the respondents but also in the in-depth interviews with heads of schools and district school quality assurance officer who found the following challenges like lack of technical support, power cut-off and poor infrastructures which could hamper the integration of ICT into the curriculum in primary schools as the technology was being used more for administrative purposes, than for students and teachers, often because of lack of resources. This means that the integration of ICT into competence-based curriculum in public primary school in Moshi Municipality was very low and, in most cases, the use of ICT technology was not integrated as a method of instruction hence the gap in quality of education between public versus private education increased. Thus, the education of basic digital skills to students was hampered thus making students fail to effectively use ICT in educational environments and to bolster national school curricula and enrich classroom learning experiences (URT,2022). Also, in order to achieve SDG Target 4.4, which says that by 2030, 'To significantly increase the number of youth and adults with relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship, ICT in education (Antoninis et al., 2023). Furthermore, these findings agree with those of Nieminen, (2020) on the challenges of integrating ICT in education in Tanzania, challenges in electrification and internet connection, thus leading to a lack of devices in public schools, inadequate IT support, inadequate digital skills training for teachers, and a chronic shortage of teachers, hence resulting into a lack of relevant learning content. Again, Ishaq et al. (2023) in their study on teacher perception of ICT integration in teaching and learning at elementary level demonstrated that slow internet speed, lack of infrastructure, and online teaching experience and training were the main

challenges preventing teachers from effective integrating ICT into teaching practice. Also, other similar studies in Tanzania demonstrated that inadequate availability of ICT devices, unreliable internet connectivity, insufficient technical support, and a lack of professional training programmes were factors hindering the ICT integration in the primary school curriculum (Mbawala &. Lestari, 2023; Joseph, 2021; Kiwonde, (2020).

Thus, in order to further improve digital learning and education or integration of ICT, additional funding for Tanzania's digital economy is required, as well as cooperation amongst the players in the education sector. For example, purchasing the right gadgets for studying both online and offline, putting devices into practice and providing support for their use, equipping teachers and students with digital literacy, and spreading knowledge about where to find pertinent digital learning materials given Tanzania's unique sociocultural setting. The secret is to give students the necessary instruction, guidance, and support to use the gadgets that are currently being used in the classroom and to become aware of the opportunities for learning that are accessible to them outside it.

CHAPTER SIX

SUMMARY, CONCLUSIONS, IMPLICATIONAND RECOMMENDATIONS

6.1 Introduction

This chapter gives the summary, conclusion, and recommendations of the study. The chapter also highlights the implications of the study, its limitations and suggests potential areas for further research.

6.2 Summary of the Study

The study assessed the ICT integration in teaching and learning in primary schools in Moshi municipality in northern Tanzania. It specifically sought to explore the availability of ICT facilities in implementing the competency-based curriculum, examine teachers' perception in integrating ICT into their lessons in implementing the competency-based curriculum, and to assess challenges in integrating ICT in implementation of CBC in public primary schools.

The study employed pragmatism paradigm. The study used convergent parallel design with mixed methodology approach. The methods for data collection were questionnaire administration and in-depth interview. The key informants of the study were teachers, school administrators (head of schools and district school quality assurance officer (DSQAO). A total of 245 teachers were involved in the quantitative component of the study while 20 heads of school and one DSQAO participated in in-depth interviews. The study findings are summarised below grounded on the three research objectives of the study.

6.2.1Availability and Experience of use of ICT Facilities for Implementing the Competency-Based Curriculum

The first research objective explored the availability of ICT facilities in implementing the competency-based curriculum in public primary schools in Moshi Municipality. The study found that mobile devices (smartphones) with Internet access and e-mail functionality, laptops, mobile device (tablet) with Internet access and e-mail functionality and desktop computers were mentioned to be available to majority of the study participants. Majority of the respondents felt that they were either experienced or well experienced in the use of computers and Internet.

6.2.2 Teachers' Perception in Integrating ICT into their Lessons in Implementing the Competency-Based Curriculum in Public Primary Schools

The second research objective determined teachers' perception in integrating ICT into their lessons in implementing the competency-based curriculum in schools. The findings show that participants were of the positive opinion that integration of ICT in implementing CBC was core for delivering quality education. Hence, schools needed to be equipped with enough ICT facilities and digital infrastructure for easy integration of ICT and proper implementation of competence-based curriculum.

6.2.3 The challenges in Integrating ICT in Implementation of CBC for Public Primary Schools

Although effective professional development in ICT integration into school organisation and curriculum practices has persistent effects on teaching and learning process, the study findings revealed that there were various challenges in integrating

ICT in implementation of CBC for public primary schools in Moshi Municipality - Tanzania which were affecting the effective implementation of CBC and learning outcome to pupils. The main challenges facing the integration were lack of ICT facilities and inadequate digital infrastructure and others included lack of technical and fund support as well as lack of enough knowledge on ICT application to some teachers and public primary schools' administration.

6.3 Conclusion

The following conclusions were grounded on the findings based on the three research objectives. With the findings in the first objective, the researcher concludes that majority of the teachers said ICT devices were available. These were mostly owned by the teachers themselves for their own use thus most of schools had inadequate ICT facilities for the integration of ICT in the CBC in public primary schools. Despite most teachers acknowledging being literate in computer use and Internet, they were less experienced in the use of common software and e-learning platforms.

Also, regarding the second conclusion is that most of the teachers recognised the importance of integrating ICT into the CBC for the purpose of improving the quality of primary education. Moreover, in the third objective, the findings concluded that the challenges faced in this process were lack of ICT facilities, inadequate digital infrastructure included lack of technical and fund support as well as lack of enough knowledge on ICT application.

6.4 Implication

Most of schools had inadequate ICT facilities for the integration of ICT in the CBC implementation in public primary schools. This implies that the integration of ICT in public primary school was minimal. Also, the study provides a snapshot on the perception of primary school teachers on the integration of ICT in the teaching and learning of the CBC. In order to meet the 2030 SDG 4, target 4.1, the current education and training policy which is underway should emphasise the need of ICT integration that will enable the provision of equitable and quality primary education for all with effective learning outcomes. Moreover, lack of ICT facilities, inadequate digital infrastructure, lack of technical and fund support as well as lack of enough knowledge on ICT application, were found to be a common challenge in most of the schools. This implies that integration of ICT into CBC implementation was low for public primary schools in Moshi Municipality. Hence, the government needs to address the challenges to mitigate the situation.

6.5 Recommendations

6.5.1 Recommendations for the Action

In order to ensure the attainment of Sustainable Development Goal (SDG) number 4 of ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all and Target 4.1 which aims to ensure that all girls and boys complete free, equitable and quality primary and secondary education thus leading to relevant and effective learning outcomes by 2030, effective integration of ICT in teaching and learning of the CBC in primary schools is the cornerstone. For the facilitation of this ICT integration, it is necessary to address the key challenges that

hinder the effective ICT integration in the teaching and learning. Therefore, it is recommended that the government should implement the following:

i. The government should increase the number of ICT devices like computers, tablets, laptops, projectors, routers and whiteboards to suit the number of teachers and students. It should also put more efforts on building better infrastructure particularly classes, satellite dishes and electricity in all schools to effectively support the use of ICT facilities during the teaching and learning process.

ii. The government should allocate special sources of income to the monthly capitation grant for provision of internet bundles to public primary schools even once in a term to support effective ICT integration to administrators, teachers and learners for the for effective delivery of quality education.

iii. The government should reduce the running costs of the electricity bills to institutions like schools or alternatively, the government could also install solar electricity devices for solving the problem of frequent and irregular electricity cut-offs during classroom lesson presentation.

iv. The successful integration of ICT into teaching and learning requires reforming the role of the teachers and transforming their pre-teaching preparation and professional development. It is therefore recommended that governments and stakeholders should ensure that teacher training institutions are equipped and prepared to use ICT adequately to expand the benefits of training and professional development programmes to all teachers and to act as the vanguard for technology-supported innovations in education.

v. The government should provide continuing education programmes for teachers on the employment of ICT facilities for teaching and learning in their classrooms.

6.5.2 Recommendation for Further Research

This study was carried out in an urban setting and thus did not explore the situation in rural settings. Also, this study did not explore the technology acceptance by primary school teachers in teaching and learning of the CBC. To the researcher's knowledge, no such study has been conducted in this country apart from the study by Koomar et al. (2022) which dwelt on reflections on technology, teaching, learning, and professional development. It is therefore recommended that a larger study covering a representative sample of regions and districts that will include rural settings and incorporating the technology acceptance component among primary school teachers, be carried out for external validity of the findings.

REFERENCES

Agyei, D. D. (2021). Integrating ICT into schools in Sub-Saharan Africa: from teachers' capacity building to classroom implementation. *Education and Information Technologies*, *26*(1), 125-144. https://doi.org/10.1007/s1 0639-020-10253-wAntoninis, M., Alcott, B., Al Hadheri, S., April, D., Fouad Barakat, B., Barrios Rivera, M., . . . Caro Vasquez, D. (2023). Global Education Monitoring Report 2023: Technology in education: A tool on whose terms?

Bahufite, E. (2017). Application of the constructivist methods of teaching-learning through the use of ICTs in Zambian schools. A case of selected secondary schools in Lusaka. *International Journal of Scientific & Engineering Research Volume*, *8*.

Bank, W. (2023). Strengthening Basic Education System and Improving Learning Outcomes in Tanzania: A World Bank Policy Note for Tanzania-Mainland. In: World Bank.

Brau, B. (2020). Constructivism.

Cleary, J., & Van Noy, M. (2014). A Framework for Higher Education Labor Market Alignment: Lessons and Future Directions in the Development of Jobs--Driven Strategies. Working Paper. *John J. Heldrich Center for Workforce Development*.

Creswell, J. W. (2021). A concise introduction to mixed methods research. SAGE publications.

Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms. *Journal of*

Practical Studies in Education, *2*(2), 25-36. https://doi.org/10.46809/jpse.v2i2.20

Fengchun, M., & Nanaieva, T. (2015). Ensuring effective use of ict in teaching and learning. *Електронне наукове фахове видання "ВІДКРИТЕ ОСВІТНЄ Е-СЕРЕДОВИЩЕ СУЧАСНОГО УНІВЕРСИТЕТУ"*(1), 179-188.

Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International journal of research in education and science*, *1*(2), 175-191.

Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, *4*(2), 38-57.

Ghavifekr, S., Razak, A. Z. A., Ghani, M. F. A., Ran, N. Y., Meixi, Y., & Tengyue, Z. (2014). ICT integration in education: Incorporation for teaching & learning improvement. *Malaysian Online Journal of Educational Technology*, *2*(2), 24-45.

Ishaq, A., Rani, M., Abbas, F., Arif, K. M., & Zia, R. B. (2023). Teacher Perception of ICT Integration in Teaching and Learning at Elementary Level. *Al-Qanṭara*, *9*(3), 85-95.

Islam, M. A., & Aldaihani, F. M. F. (2022). Justification for adopting qualitative research method, research approaches, sampling strategy, sample size, interview method, saturation, and data analysis. *Journal of International Business and Management*, *5*(1), 01-11.

Jawabreh, R., Salha, S., & Danju, İ. (2023). Teachers' attitudes toward gifted children in pre-schools in Palestine. *Power and Education*, 17577438231209389.

Joseph, P. (2022). Use and Challenges of ICT in Secondary Schools in Tanzania: A study of Selected Secondary Schools in Mikindani Municipality, Tanzania. *African Journal of Accounting and Social Sciences*, *3*(01). https://doi.org/10.1234/ajasss.v3i01.13

Kalinga, T. (2024). Teachers' technological literacy for ICT integration to implement competence-based curriculum in public secondary schools in Tanzania. *Educational Technology Quarterly*.

Kihoza, P., Zlotnikova, I., Bada, J., & Kalegele, K. (2016). Classroom ICT integration in Tanzania: Opportunities and challenges from the perspectives of TPACK and SAMR models. *International journal of education and development using ICT*, *12*(1).

Kiwonde, F. M. Opportunities and Challenges of Integrating ICT in the Teaching and Learning of Environmental Education in Primary Schools.

Koomar, S., Hennessy, S., Zubairi, A., Kindoli, R., & Kreimeia, A. (2022). Reflections on Technology, Teaching, Learning, and Professional Development: Findings from a Teacher Survey in Tanzania. *African Educational Research Journal*, *10*(4), 342-368.

Kumatongo, B., & Muzata, K. K. (2021). Research paradigms and designs with their application in education. *Journal of Lexicography and Terminology (Online ISSN 2664-0899. Print ISSN 2517-9306). 5*(1), 16-32.

Lakens, D. (2022). Sample size justification. *Collabra: Psychology*, *8*(1), 33267.

M’mboga Akala, D. B. (2021). Revisiting education reform in Kenya: A case of Competency Based Curriculum (CBC). *Social Sciences & Humanities Open*, *3*(1), 100107. https://doi.org/https://doi.org/10.1016/j .ssaho. 2021.100107

Mbawala, J. J. (2023). The use and challenges of ICT in Primary Schools: A study of selected Primary Schools in Ilala Municipal, Tanzania. The 2nd International Conference on Economics, Business, and Management Research (ICEBMR),

Mcleod, S. (2023). Constructivism learning theory & philosophy of education. *Simply Psychology*.

Mezmir, E. A. (2020). Qualitative data analysis: An overview of data reduction, data display, and interpretation. *Research on humanities and social sciences*, *10*(21), 15-27.

Mohajan, H. K. (2020). Quantitative research: A successful investigation in natural and social sciences. *Journal of Economic Development, Environment and People*, *9*(4), 50-79.

Mosha, H. J. (2012). A case study of learning materials used to deliver knowledge and skills or competency-based curricula (in Tanzania). *Association for the Development of Education in Africa (ADEA)*, *60*.

Murithi, J., & Yoo, J. E. (2021). Teachers’ use of ICT in implementing the competency-based curriculum in Kenyan public primary schools. *Innovation and Education*, *3*(1), 1-11. https://doi.org/https://doi.org/ https://doi.org/10.1186/s42862-021-00012-0

Mwendwa, N. K. (2017). Availability of resource materials and facilities for ICT integration in the Public Primary School Curriculum in Kitui County, Kenya. *Saudi Journal of Humanities and Social Sciences*, *2*, 362-368.

Mwendwa, N. K. (2017). Perception of Teachers and Principals on ICT integration in the Primary School Curriculum in Kitui county, Kenya [information, communications and technology (ICT),perceptions, ICT integration, curriculum]. *2017*. https://doi.org/10.46827/ejes.v0i0.875

Mweshi, G. K., & Sakyi, K. (2020). Application of sampling methods for the research design. *Archives of Business Review–Vol*, *8*(11), 180-193.

Nieminen, J. (2020). Landscape report on digital education in Tanzania. *Fingo Powerbank programme*

Nkya, H., Fang, H., & Mwakabungu, F. (2021). Implementation of competence-based curriculum in Tanzania: perceptions, challenges and prospects. A case of secondary school teachers in Arusha region. *Journal of education and practice*, *12*(19), 34-41.

Nombo, U. (2022). Competency-based curriculum in the teachers colleges: The challenges. *European Journal of Alternative Education Studies*, *7*(1).

Nsengimana, T., Rugema Mugabo, L., Hiroaki, O., & Nkundabakura, P. (2020). Reflection on science competence-based curriculum implementation in Sub-Saharan African countries. *International Journal of Science Education, Part B*, 1-14.

Nurpatri, Y., Muliani, D., & Indrawati, E. (2021). Implementation of constructivism approach in physics learning on students' critical thinking ability of junior high school students. Journal of Physics: Conference Series,

Nzima, I. (2016). *Competence-based Curriculum (CBC) in Tanzania : Tutors' Understanding and their Instructional Practices* [Doctoral thesis, monograph, Linnaeus University Press]. DiVA. Växjö, Sweden. http://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-48649

Okendo, E., Atoni, R., & Kitula, P. (2020). Fundamentals of Educational Research: Concepts and Methods. In: Nairobi: Rinny.

Ross, J. A. (2019). The reliability, validity, and utility of self-assessment. *Practical Assessment, Research, and Evaluation*, *11*(1), 10.

Rutayuga, A. B. (2014). *The emerging Tanzanian concept of competence: conditions for successful implementation and future development* Institute of Education, University of London].

Rutledge, P. B., & Hogg, J. L. C. (2020). In-depth interviews. *The International Encyclopedia of Media Psychology*, 1-7.

Seifu, K. (2020). Determinants of information and communication technology integration in teaching-learning process at Aksum University. *Cogent Education*, *7*(1), 1824577. https://doi.org/10.1080/2331186X.2020.1824577

Shopova, T. (2014). Digital literacy of students and its improvement at the university. *Journal on Efficiency and Responsibility in Education and Science*, *7*(2), 26-32. https://doi.org/10.7160/eriesj.2014.070201

Simbeye, V. (2020). ICT Integration in Teaching and Learning: A case of selected Secondary Schools in Morogoro Municipal Council, Tanzania.

Stephen, K. (2022). Factors Contributing to Effective Implementation of Competence Based Education and Training: A moderating effect of

Information and Communication Technology; A Case of Selected VET and NACTE Colleges in Mbeya-Tanzania. *International Journal of Marketing & Human Resource Research*, *3*(4), 188-202.

SÜRÜCÜ, L., & MaslakÇI, A. (2020). Validity and Reliability in Quantitative Research. *Business & Management Studies: An International Journal*, *8*(3), 2694-2726. https://doi.org/10.15295/bmij.v8i3.1540

Tandika, P. B., &Ndijuye, L. G. (2019). Pre-primary teachers' preparedness in integrating information and communication technology in teaching and learning in Tanzania. *Information and Learning Sciences*, *121*(1/2), 79-94. https://doi.org/10.1108/ILS-01-20190009

Tomczyk, L., & Fedeli, L. (2021). Digital Literacy among Teachers—Mapping Theoretical Frameworks: TPACK, DigCompEdu, UNESCO, NETS-T, DigiLit Leicester. In *Proceedings of the 38th International Business Information Management Association (IBIMA)* (pp. 244-252). International Business Information Management Association.

United Nations Educational, S., & Organization, C. (2011). UNESCO ICT competency framework for teachers. In (pp. iii, 92 p.). Paris: UNESCO.

United Nations Educational, S., & Organization, C. (2018). UNESCO ICT competency framework for teachers.version 3 In (pp. iii, 92 p.). Paris: UNESCO.

United Republic of Tanzania. (2023). The National ICT Policy, August 2023.

United Republic of Tanzania. (2022) ICT in Education Strategy for Tanzanian Schools, Folk Development and Teacher Colleges (2022/23 – 2026/27), July 2022

United Republic of Tanzania. (2020). Tanzania Development Vision 2025

Yamtinah, S., Utami, B., Masykuri, M., Mulyani, B., Ulfa, M., & Shidiq, A. S. (2022). Secondary School Science Teacher Response to Minimum Competency Assessment: Challenges and Opportunities. *Jurnal Penelitian Pendidikan IPA*, *8*(1), 124-131. https://doi.org/10.29303/jppipa.v8i1.1075

Zeng, W. (2022). An empirical research on China's policy for ICT integration in Basic Education from 1988 to 2021. *Educational Technology Research and Development*, *70*(3), 1059-1082. https://doi.org/10.1007/s11423-022-10079-y

APPENDICES

Appendix I: Questionnaire for Teachers

A. Questionnaire

Dear respondent, I am PROSCOVIA NOVATUS a student at Open University of Tanzania (OUT), pursuing Master of Education in Quality Management. Currently, I am undertaking a research study in partial fulfilment of the requirements for the award of Master's Degree. The objective of this study is about **"Assessing integration of ICT in implementation of the competency -based curriculum: A case of Moshi Municipality primary schools."**

All responses will remain anonymous and results from the survey will be used for an academic purpose only.

Instructions: Please answer the following questions to the best of your knowledge. Please answer all questions by putting a tick (√) or number to each appropriate answer. For questions which ask for an explanation, please answer in the space provided.

Please tick (√) your appropriate choice in the boxes provided.

1. **Gender**

   Male [ ] Female [ ]

2. **Which age range do you fall into?**

   15 – 24 [ ] 25 – 34 [ ] 35 – 44 [ ] 45 – 54 [ ] 55 - 64 [ ] Above 65 [

3. **Level of education**

   Certificate [ ] Diploma [ ] Bachelor [ ] Postgraduate [ ]

4. **What is the duration of your teaching career?**

   1 – 2 years [ ] 3 – 5 years [ ] 6 – 10 years [ ] 11 – 15 years [ ] 16 – 20 years [ ] 20+ years [ ]

5. **Do you have ICT Literacy?**

   YES [ ]NO [ ]

6. **If the answer is Yes for the question, when did you get this ICT training?**

   Before starting teaching [ ] After starting teaching [ ]

7. **How long has computer-based instruction been used in your school?**

   1– 2 Years [ ] 3 – 5 Years [ ] 6 – 10 Years [ ] 10 Years + [ ]

8. Are the following technology resources available to your school for use in your line of work? Select all which are applicable

Access to technology	YES	NO
Laptop		
Desktop Computer		
Reliable internet connection (Wi-Fi)		
Reliable internet connection (3G/4G+)		
Reliable internet connection (Local Area Network or Wire Connection)		
Mobile device (smartphone or cell phone) with internet access and email functionality		
Mobile device (tablet) with internet access and email functionality		
Mobile device without internet access		

9. Which qualities, in your opinion, are critical for teachers to successfully incorporate ICT into the classroom? Kindly order the following in order of your perception: Mark (√)

Qualities for succeeding in ICT integration	**Most Important**	**Important**	**Neutral**	**Least Important**	**Not Important**
Skills					
Confidence					
Positive attitude					
Training					
Support					
Policy					
Curriculum					

10. Kindly share your experience of the following:

Please indicate your experience with:	**Well Experienced**	**Experienced**	**Neutral**	**Not Experienced**	**Not Well Experienced**
Computers					
Internet					
e-learning platform					
Overhead Projector					
Word processor					
Spreadsheets [Excel]					
Experience using digital technologies to teach					
PowerPoint					

11. Consider your personal requirements for professional development. In each of the following sections, please indicate the degree to which you require any of these services: [4] No need at all [3] Low level of need [2] Moderate level of need [1] High level of need

Professional Development Needs	**Ranking**
Use of ICT in teaching	
Selection of ICT resources appropriate for teaching	
Use of ICT for assessment	
Knowledge and understanding of using ICT in your specific subject(s)	
Technological Pedagogical Knowledge	
Use of ICT for administrative purposes	
Use of ICT as a depository data tool	
ICT integration into the classroom	
Development of ICT skills in a particular context	

12. Consider your personal experience with technology. Could you please state how confident you are?

Strong Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
I am comfortable utilising e-learning platforms to improve ICT skills				
I feel confident operating computers				
I am comfortable instructing using resources from the internet.				
I feel confident using ICTs as teaching tools				
I am comfortable utilising ICT resources to improve my instruction.				
I am comfortable utilising online resources to encourage engagement between learners and information.				
I feel confident using e-learning resources to promote learner-learner interaction				
I feel confident using the internet to search for extra materials				
I feel confident using e-learning materials to teach				

13. Do you think your students know more about ICT than you do? YES [ ] NO [ ]

14. What challenges does your school face in integrating ICT?

Challenges	Mark (√)
Lack of enough ICT facilities	
Lack of technical and fund support	
Lack of enough knowledge on ICT	
Absence of digital infrastructure	
All the above challenges	

Appendix II: Interview guide for heads of school and DSQAO

1. Do you have **ICT Literacy?**
2. Does your school have enough ICTs facilities for implementation of Competence-Based Curriculum?
3. Are workshops and seminars appropriate component for professional development activities used to train educators to use ICT effectively?
4. What are the challenges do teachers face during integration of ICT?
5. How does quality education rely on information technology to motivate students, improve basic skills, and train teachers in technology?
6. How can ICTs in CBC change curriculum subjects into a learner-centred environment?
7. Do teachers use ICT in teaching during monitoring session?
8. Is there any government support in the integration of ICTs facilities into CBC?

Appendix III: Research Clearance Letter

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT//PG202186918 **28 August, 2024**

Municipal Director,
Moshi Municipal Council,
P. O. Box 318,
KILIMANJARO.

Dear Director,

RE: RESEARCH CLEARANCE FOR MS. PROSCOVIA NOVATUS REG NO: PG202186918

2. 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.

3. 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 **Ms. Proscovia Novatus Reg.No: PG202186918),** pursuing **Masters of Education in Quality Management**

(MEDQM). We here by grant this clearance to conduct a research titled **"Assessing the Integration of ICT in the Implementation of a Competency-Based Curriculum: A Case Study of Moshi Municipality Tanzania".** She will collect her data at your area from 29th August 2024 to 30th October 2024.

4. 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 sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof.Gwahula Raphael Kimamala

For: VICE CHANCELLOR

Appendix IV: Research Permit

THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT (PO-RALG)

MOSHI MUNICIPAL COUNCIL

In reply please quote:

Ref. No. MMC/ A.40/13/1/VOL.33/74 Date: 05nd September, 2024

Head of Division
Pre-primary and Primary Education Division,
MOSHI MUNICIPAL.

RE: RESEARCH PERMIT

Please refer to the letter with Ref No OUT/PG202186918 dated on 28th August, 2024 regarding to the heading above.

2. This letter, introduce **Proscovia Novatus** student of The Open University of Tanzania who permited to conduct the research about "***Assessing the Integration of ICT in the Implementation of a Competency – Based Curriculum"*** The permission has been granted from 29th August, 2024 to 30th October, 2024.

3. Best regards.

Angel A. Sanga
For: DIRECTOR
FOR MUNICIPAL DIRECTOR
MOSHI

C.C : Vice Chancellor
The Open University of Tanzania
MOSHI.

: Proscovia Novatus,
Student,
The Open University of Tanzania

Municipal Hall, P.O.BOX 318, MOSHI, KILIMANJARO. Phone: +255-027-2752344, +255-027-2754371/4, Fax: +255-027-2752906, e-mail: md@moshimc.go.tz, Web site: www.moshimc.go.tz

THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE REGIONAL
ADMINISTRATION AND LOCAL GOVERNMENT
(PO-RALG)

MOSHI MUNICIPAL COUNCIL

In reply please quote

REF. NO. MMC/A.40/13/1/74 Date: 06/09/2024

The Head Teachers,

J.K. Nyerere, Kilimanjaro, Mwreni, Msaranga

Azimio, Mandela, Tumâini, Mzalendo, Pasua

Jitegemee,Juhudi, Majengo, Muungano, Mawenzi

Uhuru,Mwenge, Jamhuri, Msandaka, Mnazi, na Kiborloni.

P.O.BOX 318,

MOSHI.

RE: RESEARCH PERMIT

Please refer the heading above.

2. Permission has been granted to **Proscovia Novatus** to conduct a research regarding to "**Assesing the Intergration of ICT in The Implementation of a Competency – Based Carriculum"** at Moshi Municipal from 29th August to 30th October 2024

Please assist him accordingly.

Rose M. Sandi

For: MUNICIPAL DIRECTOR

MOSHI

CC: Municipal Director - To see in the file

Proscovia Novatus,

Student,

The Universitv of Tanzania