

EXPLORING INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING AND LEARNING IN TANZANIAN HIGHER EDUCATION

A Thesis



Submitted to the Master's Study Program of Education at the Faculty of
Education in partial fulfillment of the requirements for the degree of

Master of Arts (M.A.)

by:
Siraju Husseni Barantota
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DEPOK
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ABSTRACT

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The growth and global spread of ICT is increasing and influences the reform and transformation of the education system. Recent research argues that the provision of access to better education for all has brought about a meaningful change, with ICT serving as a dynamic tool in teaching and learning. Consequently, many educational institutions in Tanzania, are working to improve infrastructure and teacher-training to effectively utilise ICT in education. Unfortunately, despite the integration of ICT into the Tanzanian education system, higher education institutions still produce graduates who are unprepared for using ICT tools. This reveals a clear gap between teacher education policies and classroom realities. Therefore, this study explored the integration of ICT in higher education in Tanzania, to explore the perceptions of lecturers and pre-service teachers. Again, this study explored the challenges encounter the lectures and pre-service teachers in executing ICT in teaching and learning. On the same point, this study explored the involvement of policy in supporting ICT in higher education in Tanzania. As a result, the research findings reveal that inadequate knowledge of ICT by pre-service teachers acts as an obstacle to using ICT effectively. Another ineffective integration of ICTs evident in Tanzania is deeply rooted in the poor infrastructure in the university environment. Furthermore, ICT policy seems to insufficiently promote ICT integration; instead, it mainly establishes initiatives and observes their complementarity. Lastly, the research recommends investing in developing ICT infrastructure, capacity building and digital literacy enhancement to pre-service teachers, reviewing and strengthening ICT policy implementation, enhancing ICT support during teaching practice, and fostering public-private partnerships.

Keywords: *ICT, Integration, Policy, Higher education*

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ABBREVIATION

ICT	: <i>Information and Communication Technology</i>
IT	: <i>Information Technology</i>
CHAT	: <i>Cultural Historical Activity Theory</i>
AT	: <i>Activity Theory</i>
HEIs	: <i>Higher Education Institutions</i>
LMS	: <i>Learning Management System</i>
HLIs	: <i>Higher Learning Institutions</i>
HE	: <i>Higher Education</i>

CHAPTER I

INTRODUCTION

1.1 Introduction

The chapter presents subsections connected to the research topic, which aimed to explore ICT in the education system, specifically in the teaching and learning process in Tanzanian higher education. The subsections involved in this chapter include background, problem, questions, objectives and significances.

In this introductory part, the background of the study, statement of the problem, research questions, research objectives and significance of the study are presented. The subsections are presented in connection to the research topic that aimed to explore the integration of ICT in teaching and learning in higher education.

1.2 Background of the Study

The growth and worldwide-spread circulation of ICT gets into increase to reinform and shift of education system. Researches including Nkula and Krauss (2014) argue that the provision for access to better education for all has made a meaningful transformation that ICT serves as an energetic instrument in teaching and learning. Thus, many educational institutions across the world work on improving infrastructure and teachers' training to effectively use ICT in the educational landscape.

This is resulted by an unprecedented development of ICT in the twenty-first century that witnesses a variation of digital technologies that is smartphones, tablets, audio equipment, computers, as well as projectors. Many studies including Saeed (2017) confirm that professionals of organizations and their knowledge of ICT impacts better education as it results into the quality of education. According to Saeed (2017), based on the current things that one can anticipate, it is very clear that the information technology will be ruling the day-to-day lives. For example, despite high pressure schedules and huge loads of tasks, still, ICT wins over all the times (Saeed, 2017). ICT has become a tool that people depend on especially in simplifying the tasks. Saeed (2017) claims that human history shows that ICT enables more tasks completion in less time and less energy. Many see this result as a method of life that facilitates their lives.

This aligns with Williams (2010) claims, that ICT is a mostly dominant in the 21st century. As an influence, many people including young generation feel comfortable when they deal with the internet, computers and other ICT tools such as phones and tablets. Nowadays, people's communication is dominated by internet whereas social interaction and access to information bases on social medias such as Ticktock, Facebook, Instagram, YouTube and Twitter. Williams (2010) claims that the internet in this 21st century has changed the people's communication system.

In the educational field, ICT is used in different ways such as means of communication through emails and WhatsApp, data analysis software tool, storage- to store information in computer, and teaching and learning tool to improve the quality of education. In the same way, Williams (2010) shows that the use of ICT has developed teachers' professionalism in Canada, hence inclusive learning that promotes quality of education. Likewise, Brush and Saye (2014) present that the effective use of ICT promotes students' confidence and encouraging students to learn independently.

Numerous educational administrators and governments have considered the trends of ICT to enhance teaching and learning in educational institutions (Buabeng-Andoh, 2012). According to Buabeng-Andoh (2012) the quick development of ICT has carried notable changes in the twenty-first century, as well as exaggerated the needs of modern societies. According to Charles et al. (2023), the advent of Information and Communication Technology has not only revolutionised the world in industrialisation but also in many varieties, including education.

Previously, before the invention of ICT, the teaching process and learning process was based on traditional methods where lesson notes were provided by teachers on board and being copied by students using exercise books. Nowadays, the integration of ICT has shifted the paradigm from traditional methods where the classroom was occupied by chalkboards, textbooks, and lectures to ICT integration in classrooms. Charles et al. (2023) argue that in order to create a better teaching and learning environment, ICT has to be used to make it easy for students to grasp complex concepts and ideas.

Thus, in many educational institutions ICT especially in this digital age is highly utilised in academic circles. The high utilisation of ICT is grounded by the rapid growth of globalization where the majority particularly in Higher learning institutions own phones, laptops, tablets and desktops. However, despite the number of laptops, phones, desktops and tablets owned by both teachers and students, the number of computers acquired by schools, currently, in Kenya still there is no significant evaluation of their helpfulness (Wims & Lawler, 2007).

The utilisation of ICT in teaching and learning needs not only having a large number of devices, such as computers but also needs more knowledge and skills that will enable the computer's users to utilise them effectively. In this regard, one of the key issues which were raised by Wims and Lawler (2007) is including staff training.

This indicates that ICT integration also depends on teachers' involvement. The teachers' participation contributes much to the success of ICT implementation in the education system. Thus, in most cases, teachers' awareness towards ICT integration matters a lot. Bindu (2017) suggests that to fulfil the increasing demand of the contemporary world, especially in ICT integration in classroom activities, both teachers and students are widely offered opportunities to become aware of the use of ICT. Moreover, Bindu (2017) present that teachers' awareness of ICT integration is very important as it brings about teachers' positive attitudes towards using ICT

in teaching and learning.

In Uganda, a designed strategic plan and support systems to improve the quality of education in teaching and learning are under educationalists. That is why ICT has brought about positive impacts on teaching and learning in secondary schools across Uganda (Charles et al., 2023). With regard to this point, the effectiveness of ICT needs government to support. Therefore, policymakers and stakeholders need to address the challenges which may affect the effectiveness and possibilities of ICT integration the education systems.

Mou (2016) argues that despite the trends of ICT to change the traditional education system, many teachers still do not use ICT effectively. The existing situation of lack of knowledge and skills to use ICT faced by many teachers may lead to poor quality education products as anticipated after the changing of the traditional education system to ICT integration in education. Mou (2016) suggests that to improve teachers training and policy-making can help to address all the concomitant barriers hence the success of ICT in education. Contrary, the unskilled teachers may ignore to integrate ICT in teaching and learning process. And if they use ICT, they do not integrate it into the significant pedagogical manner.

As reported by Brush and Saye (2014) in the USA from 2003 to 2004 government developed educational programs while considering the use of ICT in the education system. It spent a lot of money for ICT equipment. Furthermore, in Singapore, the introduction of master plan of ICT took place in 1999. Thus, ICT is included in the Singapore education curriculum to improve students' learning ability and social responsibility in lifelong (Brush & Saye, 2014). The case studies including Williams (2010) case study indicates that in Africa particularly in rural areas, ICT integration still faces some challenges such as poor infrastructure, which hinders the effective implementation of ICT in the educational landscape.

In line with this, Nguyen (2020) reports that representing an essential component of Initial Teacher Education (ITE), the practicum also presents challenges encountered by Preservice Teachers (PSTs) as they transition from university to school. Using a case study analysis, Nguyen (2020) conducted a study aiming to gain insights into a collaborative partnership between a university and schools in Vietnam through the lens of Cultural Historical Activity Theory (CHAT). CHAT originated from Vygotsky's (1978) work and was further developed by Leont'ev (1978), Engstrom (1987, 2001), and their successors. The origins of the CHAT concept can be traced back to Vygotsky's (1978) Sociocultural theory concerning the development of higher mental functions, which argued that learning occurs not in isolation but socially, through an internalization process mediated by artefacts (tools and signs).

More commonly, this is represented as a triad comprising the subject, the object, and the mediation artefact, where tools and signs facilitate the subject's realisation of the object. According to Nguyen (2020), the Cultural-Historical Activity Theory (CHAT) analyses the interconnected learning system between universities and partner schools within teacher education.

The CHAT model demonstrates how all elements — that is, the subject (pre-service teachers), the tools (teaching resources and digital platforms), the community (mentors, tutors, and peers), the rules (institutional guidelines and school policies), division of labour (among the participants), and the object (teaching competency) — converge to influence the learning experience of pre-service teachers.

Furthermore, researchers such as Ke et al. (2023) argue that high-quality professional development is crucial for preparing teachers to respond to and keep pace with reforms and policy changes. Ke et al. (2023) suggest that effective professional development programmes involve teachers in collaborative work to draw on their knowledge of everyday practice and local contexts. Co-design, or collaborative design, is a highly effective form of professional development that promotes teacher learning (Ke et al., 2023). To examine this, Ke et al. (2023) applied Cultural Historical Activity Theory (CHAT) to investigate how teachers negotiate systematic contradictions while working together to co-design and implement a four-week science unit on COVID. The study results indicated that these teachers encountered significant challenges during the implementation of the COVID-19 unit. This indicates that certain conditions can hinder the effective teaching and learning process.

This aligns with Joseph (2022), who states that though ICT facilitates learning and teaching, enhancing the accessibility of educational resources, providing a better understanding of content for students, helping students collaborate on assignments and enhancing engagement in lessons, lack of ICT infrastructure, poor ICT skills and knowledge, lack of technical support, and most importantly, lack of training for teachers are among the major constraints to the use of ICT in teaching and learning.

This is parallel to Komba and Nkunga (2022), and Mtebe (2020) shows that teacher education institutions still do not equip future teachers with enough pedagogical skills in ICT. These institutions are poorly equipped with ICT infrastructure, lack qualified tutors, and have ineffective curriculum integration of ICT; thus, Kiwonde (2024) claims that graduates emerge unwell-prepared and lacking confidence to incorporate digital tools meaningfully into teaching and learning processes. Likewise, Ngodu, Ndibalema, and William (2024) state that while ICT surely promises to enhance science teaching and learning, a lack of understanding of the context has hindered its successful integration in Tanzanian schools. Some of the context-appropriate strategies as reported by Ngodu, Ndibalema, and William (2024), capacity development for teachers, constructing and equipping computer labs for ICT access, maintaining and repairing defective computers, deploying educational technology experts, and making ICT compulsory at all education levels are very important. Conversely, Ngodu, Ndibalema, and William (2024) identify insufficient ICT facilities, limited ICT training opportunities, and digital content as key constraints related to integrating ICT into science teaching and learning in Tanzania. Nevertheless, Ngodu, Ndibalema, and William (2024) suggest that despite all the hindrances, ICT

gets credit.

On the other hand, Manyasi and Okwara (2020) also noted that even teacher educators themselves are not sufficiently trained in ICT, which limits their ability to mentor pre-service teachers effectively. The presence of ICT facilities in universities or schools does not automatically ensure their successful use; rather, the quality and intensity of ICT training during pre-service education are what truly matter. The key issue lies in the programming and planning necessary for the full integration of technology into classroom practice.

In line with this, in Tanzanian higher education it is reported that concerning ICT tool usability, specific parameters that were statistically validated to enhance student learning included the ability to operate smart screens and projectors, set up audio equipment, and use online response clickers for quizzes and surveys (Msoroka et al. 2025). These findings lead to the conclusion that the instructor's proficiency in using ICT infrastructure facilitates student learning outcomes, especially when the core ICT functionalities are well understood and used. This aligns with Msoroka et al. (2025), who recommend that higher education institutions in Tanzania should improve instructors' competencies in ICT tools. Having good ICT infrastructure, well-skilled ICT instructors in higher education may lead to better products, hence ICT-skilled pre-service teachers.

Additionally, as reported by Kibelloh (2022), the growth and development of Higher Education Institutions (HEIs) in Tanzania pose common concerns among many educational stakeholders, such as the government, students, practitioners, and management. Rapid expansion to increase student enrollment in HEIs often compromises education quality and financial considerations. Based on evidence from a comprehensive literature review, Kibelloh (2022) conducted a study highlighting the potential of online education (e-learning) to address these challenges. By expanding learning opportunities, ensuring quality, and tackling financial issues, e-learning offers a solution. These insights are then used to develop and recommend best practices for e-learning in higher education in Tanzania, based on the opportunities presented by ICT. Specifically, the recommendations cover vision and strategy for e-learning, training, communication channels, and quality assurance.

Consequently, with findings by Selemani et al. (2021) and Kiwonde (2024), it was observed that despite national initiatives to integrate ICT in the Tanzanian education system, higher educational institutions still produce unprepared graduates for using ICT tools, revealing a clear gap between teacher education policies and classroom realities. Therefore, the problem extends beyond infrastructure to the foundational aspects of teacher education, which need revisiting and strengthening. This suggests that within the education system, teachers, learners, and school environments collaborate to achieve a shared goal. This aligns with Batiibwe (2019) who states that teachers now understand learning differently. For example, learning should occur in a context that support and influence meaningful knowledge construction, especially concerning how that

knowledge is applied. Therefore, knowledge must be connected to its use in very specific ways. This is consistent with Activity Theory (AT), more precisely called Cultural Historical Activity Theory (CHAT), which presents a perspective that imagined, simulated, and real situations require personal engagement with physical objects and artifacts (including other humans) following the logic of an expected or planned future activity model (Batiibwe, 2019). Among the various effective educational research frameworks today, CHAT is among the most popular because researchers are beginning to recognise how the social aspects of learning influence students. It is often stated that CHAT has at least three generations, each evolving from the previous one (Batiibwe, 2019). The different generations are as follows.

The first generation of CHAT was introduced by Vygotsky in 1978 and is recognised as the initial phase of this framework. In his study of child development, Vygotsky argued that humans act as agents who respond to and engage with mediating elements of the environment, such as tools, signs, and instruments they utilise or manipulate to achieve a specific outcome. In this context, Batiibwe (2019) states that S is stimulus value, R is response, and X is the mediating act.

Furthermore, as the second generation, CHAT is attributed to Engstrom (1987). Vygotsky's earlier idea of mediation for wider learning with others, such as ZPD, and through interaction with artifacts, was incorporated into Engstrom's conception of CHAT. Engstrom's aim was to explain human thought within the broad context of individuals interacting in the social world through artifacts, especially in production settings. Therefore, Engstrom included CHAT in his framework, highlighting the interrelationships between the individual, the community, history, context, and the interaction of that situation and activity.

Again, Engstrom (2001) also defined activity system as networks of interacting systems that meet tensions and conflicts that promote collective learning through change, thus creating the third generation of CHAT. According to Roth (2007), each individual act is based upon Leont'ev's unity of activity, actions, and operations, thus making the unity the minimum unit of human productive behaviour. An activity, in the view of van Oers (2001), within CHAT is any motivated and object-oriented human enterprise, rooted in cultural history, and dependent for its actual occurrence on specific goal-oriented actions. Conversely, an action, according to Bakhurst (2007), is an act that can be described as arising from awareness of reasons.

In contrast, conscious actions depend on the context chosen by the subject for their performance: surrounding environments and past experiences exert influence on the kinds of unconscious actions. The integration of information and communication technology in teaching and learning processes in higher education is dynamic and involves various interacting elements: human, contextual, cultural, and policy-related. Through the lens of CHAT, this integration is not viewed as a technical adoption but rather as an activity system socially mediated and context-bound, involving the lecturer, pre-service teachers, institutional policies, and digital tools.

Batiibwe (2019) argues that CHAT also highlights the importance of situating learning in real or simulated contexts in which individuals have opportunities to relate meaningfully with both artefacts (such as ICT tools) and other human agents.

Therefore, effective ICT integration largely depends on the social context in which knowledge is constructed and applied. According to the first research objective, lecturers' and pre-service teachers' perceptions of ICT use will be influenced by their interaction with specific mediating tools (such as Learning Management Systems, projectors, mobile learning platforms, etc.) aimed at certain goals (for improved learning outcomes) and the particular cultural and historical context of their institution. The earliest generation of CHAT (Vygotsky, 1978) reminds us that this engagement is not a neutral experience; previous encounters, available tools, and a learner's zone of proximal development (ZPD) all influence it.

On a related note, challenges faced by lecturers, such as infrastructural issues, inadequate training, or lack of policy enforcement, can be seen as opposition or tensions within the activity system. The second and third generations of CHAT by Engstrom view these tensions as inherently necessary attributes that typically lead to expansive learning and systemic change. Finally, concerning the third goal, institutional policy becomes a 'rule' under the CHAT framework. ICTs are known to define the mode of access, the division of labour in responsibility, and to legitimise and sustain ICT practices within an academic community. If ICT policies are not supportive and properly enforced, lecturers and pre-service teachers will struggle to engage meaningfully with technology in teaching, thus limiting the potential of transformative ICT in education. In short, CHAT offers a comprehensive and continually evolving framework for analysing the integration of ICT, not merely as a technical or pedagogical issue, but as a culturally, historically, and socially mediated educational practice.

Thus, in this regard, the forthcoming study aims to examine how lecturers and pre-service teachers perceive the integration of ICT in the teaching and learning process, the challenges faced by lecturers and pre-service teachers in integrating ICT in teaching and learning, and to what extent the role of policy supports ICT integration in Tanzanian higher education, in turn may promote to better ICT integration.

1.3 Statement of the Problem

Essentially, if we need quality education as teachers, we need to have competencies to directly affect the total education quality. For instance, a great subject matter understanding and great pedagogical strategies provides an engaging learning environment. The teachers who learn such skills are better equipped to meet the conflicting needs of the students, lead to deeper student understanding, and promote student academic success. It helps the overall effectiveness of the system, since effective teachers are crucial for shaping student outcomes and encouraging lifelong learning.

Additionally, the level of teachers' ICT competence contributes much to the teachers' beliefs towards ICT integration. This means that the more the teachers become aware of the use of ICT, the more the teachers believe in the importance of using ICT in classroom activities. This aligns with Bindu (2017) emphasis. He insists that one of the numerous factors for the successful utilisation of ICT in the educational system is teachers' attitudes.

Bindu (2017) adds that the readiness by teachers in ICT utilisation is motivated by the teachers' awareness of ICT use. Again, Bindu (2017) pinpoints that teachers' awareness of using ICT in classrooms helps teachers to use ICT into different angles, including: PowerPoint creation and conducting tests and exams online.

Therefore, under this circumstance, the forthcoming study intends to explore the integration of ICT in teaching and learning in Tanzanian higher education to examine the perception perceived by lecturers and pre-service teachers in utilizing ICT in teaching and learning, as well as the challenges they face.

In addition, as highlighted Kiwonde (2024) and Mou (2016) in order to address the existing problem, the policy should support the development of professionalism. Thus, the upcoming study aims to investigate the role of policy in supporting the integration of ICT in Tanzanian higher education. These two reasons have created a gap in ICT integration in Tanzanian higher education that the forthcoming study aimed to fill.

1.4 Research Questions

1. How do lecturers and pre-service teachers perceive the integration of ICT in the teaching and learning process?
2. What are the challenges faced by lecturers and pre-service teachers in integrating ICT in teaching and learning?
3. To what extent does the role of policy support ICT integration in higher education?

1.5 Research Objectives

1. To examine how lecturers and pre-service teachers perceive the integration of ICT in the teaching and learning process.
2. To examine the challenges faced by lecturers in integrating ICT in teaching and learning.
3. To examine the role of policy in supporting ICT integration in higher education.

1.6 Significance of the Study

The study's findings were expected to provide valuable recommendations on improving teacher professional development in utilizing ICT in teaching and learning in Tanzanian higher education. By enhancing their ICT skills, teachers will be better equipped to integrate technology into the learning process effectively. The study will also provide alternative solutions.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This chapter presents insightful information about ICT. The discussion in this chapter relies on the issues related to ICT. Therefore, in this chapter, the literature review is presented following subheadings such as perception of teachers towards ICT integration in classrooms, students' perceptions towards ICT integration in classrooms, ICT integration in the education system, and ICT integration in the Tanzanian context.

Again, the chapter presents the theoretical framework that underpins this study. The Cultural Historical Activity Theory (CHAT) as a fundamental in ICT use in teaching and learning will be discussed. Also, in this chapter the challenges that may hinder the implementation of ICT integration in schools will be presented.

2.2 Theoretical Framework

It is argued that theoretical framework is the basic of knowledge that links studies and specifically provides the assumptions of the researchers in an educational theory (Luft et al., 2022). Within this theoretical framework, a researcher tends to review a certain theory related to the proposed study to guide the explanation of a phenomenon.

Allen (2017) presents that the values, viewpoint and social experience reveal the researchers' subjectivities. As far as knowledge is concerned, one may acquire a certain knowledge in different ways than another. For example, knowledge as facts or information may be acquired by a person through experience- theoretical or practical understanding of a subject. The existing differences in knowledge acquisition result into different perceptions among researchers.

To deal with this scenario, Grant and Osanloo (2014) suggest that a study of the theoretical framework enables one to see a study from a broad perspective which assists the researcher in appreciating the research objectives and hypotheses in a more straightforward manner. With regard to my current study, the theoretical framework focuses on some concepts which contribute to the exploration of integrating ICT in the Tanzanian higher education. Thus, in this present study, I have chosen a sociocultural theory that will guide me in conducting my forthcoming research

Furthermore, the instruments used for interviews in this research were developed and validated based on relevant theoretical frameworks such as Sociocultural Theory and Cultural Historical Activity Theory (CHAT). Sociocultural Theory and CHAT highlight: social interaction in learning (Vygotsky, 1978), mediation through tools like ICT, the importance of community, rules, and division of labour as outlined by CHAT, and context-based, collaborative learning

following the ZPD. Accordingly, data were gathered on: the use of ICT as a tool to mediate teaching and learning, social interactions around ICT (student-student, teacher-student, teacher-ICT), cultural and institutional contexts affecting ICT use (rules, roles, community), as well as perceptions and challenges related to ICT integration.

2.2.1 Sociocultural Theory

This theory has been of great significance in understanding the process of learning in a social context- learning even while socialising or interacting with others. According to Vygotsky (1978), every cognitive function starts from and is shaped by social interactions, which has been proven that learning in a vacuum, as many scholars have suggested, is practically impossible (Vygotsky, 1978). This aspect of Sociocultural theory elaborates and maintains that cultural artefacts and tools significantly mediate cognitive development.

In the same way, as reported by Hall (2007), similar to constructivist approaches, sociocultural theories view learning as active and argue that the context is crucial to learning. These initial theories are drawn from Vygotsky (1978) who asserts that learning is not solely a factor of the individual, but rather develops in social context. Additionally, sociocultural theories place a powerful focus on learning in the social environment (Hall, 2017). Thus, learning is all mediated. At the same point, Vygotsky states that mediating learning, all experts use tools during the learning process.

According to Hall (2007), if we look to sociocultural theories by Vygotsky, then the teacher function can be described in the way this person mediates in the learning process, and that is possible with the Zone of Proximal Development (ZPD). The second concept describes what sort of environment the learner needs to be able to grow cognitively. Therefore, once the environment for learning has the right level of support from others, the learner matures more when they use objects in a given context (Hall, 2017).

Furthermore, as suggested by Igira (2009), Cultural Historical Activity Theory (CHAT) has much to offer as a meta-theoretical framework to understand and analyse many areas of Information System (IS) research and practice. CHAT has deep historical roots and centuries of contemporary usage, providing it with strengths. Conceptually, CHAT provides us with a philosophical and cross-disciplinary lens for analysing different human uses as development processes where individual and social levels are intertwined (Igira, 2009). By its recent focus on systems of networks, interactions and boundary-crossings between activity systems, CHAT reflects interest in exploring and understanding interactions within their social context, across different contexts and cultures, and the dynamics and development of specific activities.

Therefore, regarding to the developed theory by Vygotsky (1978) the Cultural Historical Activity Theory (CHAT) has significantly guided me to get insight on the use of ICT as a tool in teaching and learning process. Based on CHAT contribution toward teaching and learning, ICT

promotes a user-friendly and careful approach.

Considerably, sociocultural theory is worth noting that cultural tools influence the processes of knowledge creation, dissemination, and acquisition. This is a contribution that expands on Vygotsky (1978) concern that learning is a social activity. It further emphasises how such interactions may lead to cognitive growth if the learner is assisted by ICT integration with the help of students- students and students-teachers interaction.

2.3 Literature Review

Luft et al. (2022) assert that in the education system a literature review plays an important part. In this part of the literature review, researchers survey to get information about their proposed studies. During surveying, in this section of the literature review, the researchers come to understand not only how and what is already known but also what is not known concerning their area of investigation.

In line with this, Maxwell (2012) argues that literature review in education allows articulating what has been already researched in a particular domain while offering the gaps that need to be addressed and therefore justifies the current research's aim and methodology framework in question. The discovered gap provides help to a researcher to identify areas for further research while giving a foundation of knowledge on a topic to be researched. Therefore, the design of this chapter, in this study is defined as the parameters of integrating ICT in higher learning institutions.

To this point, the section gets down starting with the literary studies related to Vygotsky's (1978) sociocultural theory specifically in education, along with the idea of ICT integration in contemporary education. Understanding these theoretical perspectives is critical in assisting comprehending the value of ICT which forces the shifting from traditional pedagogical approaches of teaching and learning process into the computing method.

Moreover, in this chapter I have presented the studies related to integration of ICT in educational landscape which were conducted globally. Additionally, the studies discussing the barriers to the Effective integration of ICT particularly in education were not left behind.

2.3.1 Reviewed Studies Related to My Present Research

The following is the summary of the researches which have already been done on a specific topic which has identified questions that remain to be answered in this present study.

2.3.2 Definition of The Key Concept

With reference to Lund (2012), any tool that can be used to enhance learning, such as computers, tablets and phones is defined as ICT. However, those tools can be used in different

ways such as data analysis software tools in turn which can be also defined differently.

Moreover, according to Freeman and Hasnaoui (2010) Information and Communication Technology (ICT) is the use of technologies in collecting, editing, storing, and passing information in numerous systems. To consider it, under this circumstance, ICT is used as a tool for data collection and simplifying communication.

On the other hand, ICT is used as a means of communication whereby information is passing through from one person to another. As a means of communication, for example, people may use models and emails to share information. This aligns with Freeman and Hasnaoui (2010) concerns. Freeman and Hasnaoui (2010) describe ICT as a means of communication in which information is collected and assembled, via technology.

Additionally, the United Nations Development Programme (UNDP, 2005) confirms that ICT is considered as the use of technology appropriately to communicate information. ICT is a general term that consists of a variety of devices to communicate information effectively. At this point, communication devices including computers, radio, cellular phones, networks, satellite systems, and television are considered as components of ICT (UNDP, 2005).

Again, according to the C-Department of Information Technology, Government of India, ICT is the creation, transmission, storing, displaying and sharing or conveying of information by using technological forms such as network hardware, software, emails and videoconferencing (UNDP, 2005). Simply, ICT refers to a set of technological devices used to simplify the collection of data, information creation, storing, managing as well as conveying information effectively.

However, in this study, ICT is considered as modern teaching and learning method that has transformed traditional learning methods and strategies at different levels of education in many countries (Selemani et al., 2021). Specifically, for the purpose of this study, ICT refers to the ways in which ICT tools such as computers, tablets, laptops, projectors and other forms of technology that can be used in classrooms for education purpose are made as tools in teaching and learning.

2.3.3 Integration of ICT in Education

The study carried out by Masino (2013) that focused on the ICT use in teaching process in the Caribbean, pinpoints the significance of ICT in education system. However, some challenges such as a lack of teachers' training and poor infrastructure hamper the effective use of ICT in the teaching process. Masino's (2013) study explored to what extent ICT play a big role in enhancing teaching and learning, particularly distance learning in the Caribbean Region. Masino's (2013) study employed a survey study where 58 course coordinators were the study's respondents.

Based on the results, Masino (2013) highlights the opportunity for teachers' training. Despite the challenges faced by course coordinators in the effective use of ICT in the teaching

process. Masino (2013) study has contributed to my forthcoming study that implementation of ICT depends on many factors including awareness of ICT knowledge to effective utilisation of ICT tools.

According to du Plessis and Webb (2012) claim, ICT integration goes hand in hand with teachers' training. They argue that the effective use of ICT in teaching and learning depends on teachers' awareness. Normally, in teaching and learning environments teachers play a big role, especially in decision making. The teachers' role in deciding an appropriate teaching method affects the rate of ICT integration in the classroom. The teachers' awareness in this study, means understanding both the importance of ICT application in teaching and learning and teachers' competence in ICT use. Teachers' responsibility in enhancing students' learning outcomes needs professionalism.

Thus, for ICT to be integrated into classrooms effectively, teachers should attend different training programs related to ICT knowledge and skills (du Plessis & Webb, 2012). By doing so, teachers will bring up-to-date their knowledge to match today's 21st century. In today's 21st century, ICT is reported to meet different learning processes (Alberta Education, 2010). Therefore, to transform the traditional education system needs teachers' abundant participation. Teachers need to know how ICT tools are used to solve learning difficulties faced by students. This aligns with The International Society of Technology in Education (ISTE) prominence, teachers are in charge of providing ICT-based to resolve learners' difficulties in the learning process.

Again, according to Mittler (2007) ICT plays a big role in reducing learner's barriers to the learning process. The learners' ability to engage in learning activities is also argued to be promoted by ICT use in classrooms. this aligns with Alemu (2015) who asserts that, the quality education depends on qualified teachers with mastering technology. In the education system, ICT has been portrayed as the best method in teaching and learning compared to traditional method. However, the ICT impact remains a debate among scholars such as researchers.

Alemu (2015) in his study aimed to explore the integration of ICT in teaching learning while focusing on coming impacts by highlighting the challenges and way forward, claims that the system of education has been changed from traditional method to the use of ICT, however, the effect still low. This situation awakens up researchers to explore real situation in education settings to come up with solutions. According to Alemu (2015) study findings, it is emphasised that despite the challenges faced by teachers and students in integrating ICT in schools, there is a need of having some tensions on the matter. In this regard, my work will focus on collecting teachers and students stands on ICT integration hence way forward.

2.3.4 Perceptions of Teachers on the Integration of ICT in Education

Teachers' beliefs about the importance and value of integration of ICT in education is one of the key factors in successful technology infusion. Contrarily, despite the teachers' recognition of ICT integration in teaching and learning careers, some teachers are still left behind in the effective use of ICT. This aligns with Gumartifa (2016) report, that the improvement of quality education. Moreover, despite the efforts made by the government and education system including the worldwide view, a large number of teachers is still left behind of the use of ICT.

Gumartifa (2016) study was conducted to develop a deep understanding of the contribution of ICT integration in education to attain successful teaching and learning. According to Gumartifa (2016), before ICT is integrated into the classroom, there is a need for teachers to become knowledgeable on the application of ICT into classroom practices. Significantly, the teachers' ICT knowledge and skills help teachers to utilise ICT effectively and be able to handle the barriers of ICT integration.

Furthermore, the awareness of ICT applications provides teachers with the confidence to use ICT in classroom environments. Gumartifa (2016) reports that teachers' ICT incompetence is a big challenge for teachers' response towards ICT implementation because of a lack of confidence. Most teachers who are concerned with little understanding of the use of ICT tend to skip ICT integration in classrooms.

In connection to this, the work of Oyefara et al. (2021) entitled; "ICT Utilisation and Associated Barriers in Teaching among Middle-level Academics in Nigerian Universities" pinpoints the teachers' perspectives on ICT usage. Oyefara, Adejo and Adisa's (2021) study was conducted aiming to seek to understand the barriers that hinder the act of using information and communications technology (ICT) in the academic field specifically the Nigerian academics in the Nigerian context. The study found that there is a significant relationship between the availability, utilisation and quality of teaching in Nigerian universities. Therefore, in line with this, I am encouraged to explore to what extent Tanzanian educational Policy plays a big role in overcoming the same problems.

Again, Ghavifekr and Rosdy (2015) study which was conducted to analyse teachers' perceptions of the effectiveness of ICT integration to support the teaching and learning processes in classrooms, reveals that ICT promotes students' collaborative learning skills in solving the problems as well as self-determinant in responding to their duties. The teachers' perception of ICT use in classrooms seems to acknowledge the value of integrating ICT in classrooms by highlighting the importance of ICT as it helps to enhance students' achievements in active teaching and learning environments.

However, despite the initiative efforts made by the Malaysian government to address the problems faced by teachers in implementing ICT integration in classrooms including an introduction of a New National Education Blueprint 2013-2025, there is a contradictory teachers'

efficacy beliefs on ICT integration which is grounded by school management and culture (Ghavifekr & Rosdy, 2015). In this regard, I come to figure out that apart from government efforts to support the use of ICT in teaching and learning by upgrading education systems, provision of computers, tablets and availability of internet connection, there is a need to explore the teachers and students' attitude on the ICT use in classrooms.

Ghavifekr and Rosdy (2015) study is significant as it has highlighted the importance and contribution of the government in enhancing the possibilities of ICT integration in schools and how teachers perceive the use of ICT in classrooms. Under this circumstance, therefore, my forthcoming study intends to examine how teachers and students perceive the integration of ICT in the teaching and learning process

2.3.5 Perceptions of Students on the Integration of ICT in Education

Despite the understanding of the importance of ICT use in the education system still there is a delay in ICT integration in teaching and learning. Unwillingness of ICT implementation has been drawn as one of the factors which discourages the application of ICT in schools among students. Al-Shboul et al. (2017) present that the willingness of students to adopt new technology in schools leads into the ICT utilisation in teaching and learning. Al-Shboul et al. (2017) conducted a study to investigate the current status of ICT use in Jordanian university as acknowledged by Jordanian university students. In this study, Al-Shboul et al. (2017) show that despite the barriers which face ICT utilisation, undergraduate students in the University of Jordan have a positive perception toward ICT use in class. From this point of view, I am inspired to explore how Tanzanian higher education institutions perceive ICT integration in their daily teaching and learning activities to improve the quality of education in the Tanzanian context.

Gu et al. (2013) claim that the improvement of ICT worldwide has been observed. It is argued that the rapid growth and development of ICT opens a door for teachers to utilise the digital tools such as ICT devices (Gu et al., 2013). However, ICT is claimed to be used effectively in a few educational settings for different reasons, including acceptability. To understand the difference between teachers' and students' acceptance of technology. Gu et al. (2013) conducted a study entitled, Meeting the "Digital Natives. The teachers and students' taking to use of ICT in classrooms creates an environment for technology to be used in teaching and learning.

For example, many students, especially those residing in urban areas or from privileged backgrounds, are eager to use data analysis software in order to promote their learning and acquire competencies that are important for the work environment in the future.

Students who comprehend ICT devices, including statistical packages and data analysis applications, are more inclined to consider these instruments as significant tools in their course of study. They consider the advanced logistical integration of data analysis software as a means to help them inherit practice in skills such as data interpretation and analysis, problem-solving,

and research, which all form a major core in today's global workforce. However, rural students tend to encounter challenges associated with the usage of modern technology, such as a lack of certain tools or devices and poor internet coverage.

This gap leads to the synthesis of certain students towards the use of certain ICT devices or tools in a way that would influence their academic outcomes as well as their career prospects. Thus, in this study, lecturers and pre-service teachers' perceptions was examined.

2.3.6 Integration of ICT in Tanzanian Context

A very recent study conducted by Kiwonde (2024) confirms the integration of ICT in teaching and learning in Tanzanian education settings. Again, the study of Mugobi and Mlozi (2021) indicates the trends of ICT integration in the Tanzanian education system. In educational settings, the teaching method is highly considered to improve the quality of education. The introduction and implementation of ICT in teaching and learning have been discussed a lot. There are many factors taken into consideration when it comes to the issue of ICT integration in classrooms. Mugobi and Mlozi (2021) conducted a study to assess the external factors influencing ICT usage while focusing on exploring practices in the Tanzanian context. As a result, Mugobi and Mlozi (2021) present that one of the external factors influencing ICT usage is the environmental factor. For ICT to be used effectively, a supportive environment with good infrastructure. The study used a pen and paper self-administered questionnaire for data collection.

Finally, Mugobi and Mlozi (2021) study findings reveal that despite the existing challenges such as ICT infrastructure, high student-to-computer ratio, and limited ICT knowledge and skills to teachers in learning and teaching, ICT is every day getting credit. In Ngodu et al. (2024) study the sequential design under mixed methods was employed whereas data were collected from science teachers and heads of schools. From the results, numerous challenges that hinder ICT integration have been presented. Lack of ICT facilities has been pointed out as a barrier for ICT integration, meanwhile limited ICT training opportunities for teachers were highlighted as the major problem. From this point of view, I am convinced to explore the integration of ICT in higher education.

2.3.7 Challenges that may be Encountered in Information and Communication Technology (ICT) Integration in Education.

The study conducted by Benali et al. (2018) reveals that the learners' digital content seems to be more advanced. Therefore, it needs more improvement for the official teachers' professional development. The study by Benali et al. (2018) was conducted in Morocco. Due to the adaptation of the competence framework for the digital competence of educators. Benali et al (2018) study aimed to explore the Digital Competence of Moroccan Teachers of English.

As reported by Benali et al. (2018) the study employed a quantitative and descriptive

design to allow for the investigation of relationships among variables. The Google survey form for the testing with Moroccan teachers and the questionnaire comprised 22 items to assess teachers' digital competence, was conducted to collect data.

As a result, Benali et al. (2018) argue that one of the key fundamentals for the building of useful pedagogical knowledge for practice and enhancement of the learning process is teachers' digital competence. Digital competence is very important which teachers should possess to handle the version and paradigm shift from the traditional education system to ICT integration. In recent years, the major concept in the discussion of what skilled people should have in the knowledge society is digital competence possession (Benali, et al, 2018).

Unfortunately, most teachers encounter a low level of ICT competence. Concerning Benali et al. (2018) it is claimed that despite the teachers' confidence in using information and communication technology in teaching, they are faced with incompetence in using digital technology to do formative and summative assessments effectively. To this point, there is a need to enhance pedagogical knowledge and upgrade the teachers' professional profile in using ICT in teaching and learning.

Additionally, Benali et al. (2018) address the innovation of using ICT in teaching and learning for educators, there is a need for policymakers' involvement. Under these circumstances, therefore, in this forthcoming study, I am inspired to explore the supportive power done by policymakers to support the integration of ICT in teaching and learning in Tanzanian higher education.

Again, Hafifah and Sulisty (2020) argue that in higher education settings in Indonesia, ICT is still under research. In this digital age, teachers and students are required to be well-equipped with digital literacy that will enable them to use ICT applications as teaching and learning methods. Recent studies, including Hafifah and Sulisty's (2020) study disclose that ICT integration in teaching and learning requires both teachers and students to be competent.

Hafifah and Sulisty's (2020) study was designed to investigate teachers' knowledge, experiences, ICT literacy levels, and to what extent they integrate ICTs in English language teaching. During the investigation, Hafifah and Sulisty's (2020) study employed an online questionnaire which was provided to 280 English language lecturers at different universities in Indonesia through emails and social media messengers. The study findings reveal that in Indonesia, the majority of English language lecturers are competent in using ICT in their activities, particularly in teaching and learning.

However, Hafifah and Sulisty (2020) study reports a deficiency of digital devices. Thus, the study recommends that policy should strongly support ICT facilities so as to reach greater ICT integration in English language teaching in higher education.

In this case, although Hafifah and Sulisty (2020) study was conducted in the Indonesian context, meanwhile, my forthcoming study is expected to be conducted in the Tanzanian context, it is very

important to my study since it has confirmed the online data collection that was my worry about. Again, despite Hafifah and Sulisty (2020) study relying on lecturers only, my forthcoming study will involve lecturers, students and policymakers as participants during data collection.

2.3.8 Teachers' Awareness And Roles Towards ICT Integration

Regarding the trends of ICT integration in the education system, teachers, tutors, and lecturers should be skilled in using ICT in the teaching process. Rahimi and Tafazoli (2022) emphasises that the effective management of classes needs educators to be highly digitally competent, especially in this digital era where the enormous integration of ICT in the education system including higher education is every day getting credits.

The level of teachers' ICT competence has been discovered as one of the reasons for teachers' attitudes towards ICT integration in teaching and learning. This aligns with Rahimi and Tafazoli (2022) study's findings. Rahimi and Tafazoli (2022) conducted a study to explore the roles played by university teachers in their attitudes towards integrating ICT in higher education. Rahimi and Tafazoli (2022) study employed a questionnaire design to meet the demand for data collection. As a result, Rahimi and Tafazoli (2022) present a mutual relationship between teachers' high digital competence and ICT integration. The study reveals that the teachers' digital competence results in teachers' awareness of their roles in managing the class with ICT integration. This implies that, the more teachers' ICT competencies the more ICT to be brought into classroom activities. Contrary, the teachers' low level of ICT competence creates an environment for the teacher to skip ICT implementation in classroom activities.

Additionally, the roles of teachers in ICT integration in teaching seem to be very crucial as ICT needs teachers' professionalism in applying ICT in the teaching environments. Teachers contribute a lot to ICT implementation. Buza and Mula (2017) argue that, for a long time, since ICT has been acknowledged as a modern teaching method in this digital era, more efforts have been made in preparing teachers who will practice and integrate ICT in teaching and learning.

However, in Tanzania, despite the efforts made by the Ministry of Education to prepare teachers to cope with the 21st century, as reported by Mugobi and Mlozi (2021) still, secondary school teachers are faced with a low level of ICT competence. Furthermore, according to Buza and Mula (2017) teachers need to be aware of the ability to apply ICT in the teaching environment. Aware, the teachers will be the key role models and will execute responsibilities for creating a good environment in the class. By doing so, students will be given opportunities to utilise ICT in their learning process.

2.3.9 Previous Studies Relating To CHAT And ICT Integration In Education

Cultural Historical Activity Theory (CHAT) is a body of literature that got its origin in the 1920s in the Soviet Union under the socio-historical school of Russian psychology (Igira,

2009). Furthermore, as reported by Igira (2009), CHAT describes the theoretical tradition of CHAT as having gone through three generations, or phases: The first phase involves a mediated action, and the second phase concerns with the field of the individual in collective activity, then the third focuses on the multiple, intertwined activity systems and border crossers between them. Based on these three phases, therefore, it is claimed that in teaching and learning, students and teachers are intertwined.

This demand of students and teachers depending on one another is connected to the Zone of Proximal Development (ZPD). ZPD is a core CHAT concept that has special significance for transformational learning (Igira, 2009). Vygotsky (1978) defined ZPD as the distance between the actual development level as determined by individual problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers, or through the use of culturally produced tools. Additionally, Vygotsky proposed ZPD in the context of mass education and literacy campaigns in 1920s Russia for children and adults learning 'higher scientific concepts. As a result, many scholars have interpreted the notion of a ZPD as being focused mainly on interaction between one who has a particular expertise and those who do not, in which the state of knowledge of the latter is advanced through the social interaction they have with the expert (Igira, 2009).

As an insightful lesson from ZPD, it is believed that there are some circumstances where one student can complete a certain activity on his own; meanwhile the same student can complete a certain activity by cooperating with his colleagues or seeking an assistant from a teacher. Importantly, in my forthcoming study, ZPD has a significant role as it discloses the characteristics of learning such, as students – students (peer group) interactions and student - teacher interactions in teaching and learning process.

2.3.10 ICT Infrastructure in Tanzanian Higher Education

The Learning Management System (LMS), which primarily operates through the Internet, promotes teaching and learning in higher education institutions (HLIs) (Mtani, 2022). Although many benefits come with using these LMS in institutions, their adoption remains a challenge. Therefore, Mtani (2022) conducted a study to explore the factors influencing LMS usage in HLIs. The findings showed that perceived usefulness, instructors' self-efficacy, and intrinsic motivation all affected LMS use among instructors in HLIs. However, as Mtani (2022) reports, Tanzanian higher education institutions face issues such as poor ICT infrastructure, insufficient training, unreliable internet access, and lack of knowledge, all of which hinder instructors' use of LMS. This suggests that management and LMS implementers in these HLIs need to improve LMS adoption among instructors by addressing training, motivation, and network infrastructure concerns.

Furthermore, in this digital age, digital transformation in higher education modifies traditional educational systems toward technology-facilitated learning (Mirata, 2022). According to Mirata (2022), the global pandemic COVID-19 pressed policymakers and university managements around the globe to fasten the pace of digital transformation in many universities in their sordid rush to ensure education continuity through educational technology. In this regard, Mirata (2022) conducted research to specifically discuss the critical factors for successful technology-based learning and technological innovations using an illustrative case of the Open University of Tanzania (OUT). As stipulated in this study, the technological challenges associated with ICT infrastructure, which comprise the internet and network or technological equipment, in turn affect the adoption of technology-based learning in higher education.

Additionally, quite clearly, according to Swai (2022), institutional factors such as teaching and learning facilities are key determinants of students' learning outcomes and the ways instructors can creatively and innovatively plan their teaching. Swai (2022) explicitly demonstrated that in Tanzanian higher education, perceived improvements had occurred in college teaching and learning facilities over the past two years, as seen by student teachers (pre-service teachers). Generally, as reported by Swai (2022), students' perceptions showed relatively lower satisfaction with ICT, in-class teaching aids, and science facilities, while they expressed more satisfaction with tutors' instructional strategies than with access to and use of college facilities.

In this regard, the integration of ICT in Tanzanian higher educational institutions remains a prominent yet largely unachieved goal within the broader vision of modernising education through digital means. Although the importance of Learning Management Systems (LMS) and other ICT facilities in supporting teaching and learning is widely recognised, numerous challenges hinder their effective adoption. These include inadequate infrastructure, poor instructor training, unreliable internet connectivity, and a lack of digital literacy, which all impede the realisation of ICT-based educational approaches (Mtani, 2022). Mirata (2022) reaffirmed this perspective, providing evidence that even urgent digital transformation efforts, such as during the COVID-19 pandemic, were hampered in higher education institutions like the Open University of Tanzania by fundamental technological shortcomings. Additionally, a study by Swai (2022) indicates that, although pre-service teachers acknowledge improvements in teaching strategies, their disillusionment with ICT facilities and resources reveals gaps in digital readiness. Collectively, these studies underscore the critical need for a comprehensive system of interventions, including infrastructure and connectivity, capacity-building, institutional support, and sustained investment in ICT-enhanced pedagogy. Without these, higher education institutions may remain unprepared to equip future teachers with the digital skills necessary to transform secondary education in Tanzania.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

In order to reach the intended goal of this study, selecting an appropriate research methodology is very important. This study was carried out following various research methodological processes such as research, paradigm, approach, design, area of the study, and data collection methods: sample size, sampling techniques, and data analysis methods to achieve the targeted objectives. Additionally, ethical considerations are also discussed in this chapter.

3.2 Research Paradigm

This study was guided by the interpretive approach, which is concerned with understanding the meaning from the participants' view. Creswell (2013) argues that the researchers' interpretations tend to rely on participants' views based on the situation considered. Thus, in this study, the findings were analysed and interpreted based on the respondents' views.

3.3 Research Approach

The study employed a qualitative design. Qualitative research aims to get insights into the constructions of reality (Cropley, 2019). The integrity of qualitative research depends on attending to the issue of trustworthiness of the study. Moreover, Mohajan (2017) and Slevitch (2011) assert that the progenitors of qualitative research methods can be linked to anthropology, philosophy, psychology, history, and sociology, with the main aim of focusing on the systematic explanation and analysis of the phenomenon. Again, according to McMillan and Schumacher (2010), a qualitative approach helps a researcher to collect data while interacting with his or her respondents by conducting observations and interviews.

Likewise, Creswell et al. (2014) present that a qualitative approach helps a researcher to understand, analyse words and report information based on the nature of study settings. Thus, in this study, I was interested in using a qualitative approach by conducting interviews with the main aim of focusing on exploring closely the required data that allowed me to acquire first-hand information on the ICT use in teaching and learning in higher education. In line with this, it will help me to facilitate understanding and make a systematic explanation and analysis of the phenomenon that ought to be studied.

3.4 Research Design

In a research study, a researcher tends to decide on a research topic, methods and area for conducting the study, that is research design (Babbie & Babbie, 1998). Furthermore, according

to Sullivan and Dejong and Ling (2013) define a research design as a researcher's strategy for how data collection will be made. Moreover, Saunders and Lewis (2017) argue that a research design refers to an approach that answers defined research questions. However, according to the nature of study settings, the researcher's strategy may or may not be retained. Accordingly, a researcher needs to have a strategic plan that is sufficient to study strings, including distance and nature of study participants.

Therefore, in my forthcoming study, I employed a phenomenological qualitative design which applies a strategic inquiry to identify the essence of human experiences (Creswell et al., 2014). A phenomenological research design is concerned with people's understanding of social and psychological phenomena as perceived by other people (Groenewald, 2004). On top of that, the researchers tend to apply a phenomenological design aiming at exploring existing experiences practised by a certain group of people (Groenewald, 2004). For this reason, in my forthcoming study, I am encouraged to apply the phenomenological design to explore lecturers' and pre-service teachers' experiences with ICT integration. The lecturers' and pre-service teachers' experiences with ICT integration in teaching and learning will provide their insights into the challenges and perceptions towards ICT application in classroom activities. This aligns with Guetterman et al. (2015) views. To identify the essence of human experiences, a researcher needs to have an inquiry strategy that will help to reach and gain information. Under these circumstances, lecturers' experience identified how far the teachers have been using ICT in teaching and learning.

A research design is a procedure for collecting, analysing, interpreting and reporting data in research studies (Creswell, 2013). On the other hand, the research design sets the procedure for the required data, the methods to be applied to collect and analyse these data, and how all of this is going to answer the research question (Payne & Grey, 2014). The research design is also characterised by in-depth investigations of a single entity or a small number of entities. It may be an individual, family, group, institution or other social unit.

Additionally, according to McMillan and Schumacher (2010), a research design serves as a master plan for investigation, providing evidence in answering research questions where the descriptions of the way data will be collected in clearly stated. Thus, in this regard, the data therefore will be collected from interviews to get an in-depth understanding of the ICT integration perceived by teachers and students in higher education.

3.5 Study Area

The research was directed in Tanzanian universities specifically in Morogoro municipality. In Morogoro municipality, there are five universities. However, in this study, the data were collected from one of the five Universities found in Morogoro municipality. I was convinced to conduct my study at the higher education that to explore ICT integration by highlighting the way lecturers and pre-service teachers perceive it and the challenges they

encounter. Thus, I have chosen one university which is categorised in the educational field.

3.6 Sampling Procedures

A sampling procedure is a plan which is definite for gaining data from a certain population (Kothari, 2004). That is, it refers to the technique or the procedure the researcher would adopt in selecting items for the sample. In this regard, I was expecting to reach lecturers, pre-service teachers, and policymakers as the respondents to my forthcoming study. Therefore, this study constituted nine (9) participants: four (4) lecturers and four (4) pre-service teachers from department of education at the expected university in Morogoro municipality.

Additionally, one policymaker from ministry of education in Morogoro region was also involved in this study as a participant to examine the role of policy in supporting ICT integration in higher education. The study involved a small number of higher education institutions, lecturers and pre-service teachers to gain an in-depth understanding of the issue. This is in line with what Kvale (as cited in Nik Suryani, 2008) states, the number of subjects depends on the study purpose. Furthermore, Kvale (2008) asserts that it is typical to study a few individuals or cases in qualitative research. Therefore, as I stated above, there are five universities in Morogoro municipality. But each university has its area of specialisation. Some of them specialise in agriculture while others specialise in business studies. However, the university that I am anticipating to deal with its major is education. Thus, concerning my study, I was convinced to conduct my research at this university.

3.6.1 Sampling Procedures for Lecturers

As for the lecturers' sample, to obtain relevant data for the present study I will invite the head of department of education to be involved in my study. Again, I asked the head of department to assist me in reaching other lecturers to meet the number proposed in my forthcoming study. In this study, my sampling procedures follow the idea that the researcher may purposefully choose the subjects that he or she believes will be able to provide him important information (Patton, 1980). With this regard, I believed that the anticipated and aforementioned lecturers will provide me with important information about the integration of ICT in their teaching process.

3.6.2 Sampling Procedures for Pre-service teachers

Again, due to my distance, I requested the head of department of education to find pre-service teachers who will be able to provide the information needed. The head of department with collaboration of other lectures in their respective duties requested to look for pre-service teachers to participate in this study.

3.6.3 Sampling Procedures for Policymakers

Policymakers' perspectives and experiences in terms of the implementation of ICT policy concerning ICT integration in Tanzanian higher education was one of the areas to consider. From their experience in enacting ICT policy the researcher was expecting to know to what extent does policy support ICT integration in higher education. Therefore, given the long distance as the researcher is far away from the research area, the main method of data collection will be an online interview. The initial contact and follow-up communication with the target policymakers in Morogoro region will be established. The researcher will reach out to prospective policymaker via formal email, letters and WhatsApp numbers provide in their official website. Again, despite the establishment of communication to reach out one of the regional policymakers via email and WhatsApp, I had already prepared someone who is in Morogoro, to send a hard copy of the letter at Morogoro ministry of education office to seek for permission.

3.7 Data Collection Methods

Data for this study were collected from interviews. Interview, according to Bogdan et al. (2003), particularly a semi-structured interview allows for focused conversational, two-way communication which is preferable in exploring and discussing one's experience. The interview will allow me to get information, and to provide flexibility to ask questions during the conversation (Cohen et al., 2011). In this study, the interview was only one tool to be employed to collect data. The interview was conducted between me and my participants through an online conversation.

For the interview to be successful, as Mugenda and Mugenda (2003) demonstrate, I established a friendly atmosphere with the interviewee by introducing myself and allowing them to be flexible in the language used for communication. As some of the pre-service teachers are reluctant to use English, I therefore, allowed them to air out their opinions in both English and Kiswahili. However, the translation method was applied to translate Swahili words into the English language as this study was going to be conducted in the English language.

3.8 Data Analysis Plan

The qualitative data which were collected through interviews were evaluated about their content. In this study theme and systematic analysis were employed. Kombo and Tromp (2006) assert that systematic content analysis is preferred to classify signs and words from the respondents according to their meaning. Thereafter, the analysis of the data had been done concerning the category and relationship of words and concepts concerning the research objectives. Therefore, the process of data analysis started soon after collection of data that involved an online interview. This process of data analysis began by transcribing the collected data which were in form of audio into texts. Then, the transcribed data were coding into different

themes concerning the research questions in relation to the research findings. Finally, the themes were reported by being presented and interpreted.

3.9 Trustworthiness of the Study

The study witnessed trustworthiness by reducing the researcher's preference. Also, the researcher ensured that data arise from respondents and not the researcher's thoughts. To create trustworthiness within this study, credibility and transferability were observed and considered as factors for trustworthiness.

3.9.1 Credibility

Stahl and King (2020) assert that credibility asks "How congruent are the findings with reality?" Furthermore, credibility ensures the quality of the researcher being trusted and believed in his work to present the findings with reality. Therefore, I created an environment of being trusted and believed by the respondents of this study whereby I was expecting to manage the time in that it will help me to collect the data easily.

3.9.2 Transferability

This qualitative research maintains that designs and accounts after one setting might put on to such automatic breakdown and the ensuing associated observations replicate unlike procedures in the study turn (Stahl & King, 2020). Therefore, the transferability of qualitative data guaranteed the study findings to similar settings or individuals. Moreover, as this study will be carried out in Morogoro municipality, the study ensured that the findings of this study may be applicable in other areas with similar fields.

3.10 Ethical Considerations

Keya (1989) emphasises researchers to create credibility to assure his or her trustworthiness to the research respondents. Furthermore, Keya (1989) clings with firm stands that privacy has to be taken into consideration to protect human rights by following individual and group ethics. In this regard, I followed the procedures put by the university organisation as required.

3.10.1 Seeking for Permission

I first asked for permission to conduct research from the Universitas Islam International Indonesia. through. From there I then asked for a letter of introduction to be handed to the expected university where my study was conducted.

3.10.2 Confidentiality and Anonymity

Confidentiality refers to the way that the participants' information such as name, and workplace are not exposed to the majority (Patton, 1980). To maintain participants' confidentiality, their real names will not be used in this study. Instead, I used anonymous to replace their real names. Again, anything that will be raised during the interview will not be exposed, rather the information was used in this study only.

CHAPTER IV

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The present chapter seeks to reveal an analysis and interpretation of data collected under a qualitative approach, whereby an online interview between the researcher, lecturers and pre-service teachers was conducted. In this line, the data were collected based on the three research objectives: to examine how lecturers and pre-service teachers perceive the integration of ICT in the teaching and learning process, to examine the challenges faced by lecturers in integrating ICT in teaching and learning and to examine the contribution of policy to support ICT.

The results and discussions of this study presented in this chapter relate to the perceptions of lecturers and pre-service teachers towards ICT integration in teaching and learning, as well as the challenges encountered by both groups in integrating ICT within Tanzanian higher education. Additionally, the government was also involved in this study, particularly regarding the third research question: to examine the role of policy in supporting ICT integration in higher education. This focus was on policy supports, policy implementation, and the obstacles encountered in executing ICT policy in Tanzanian higher education.

4.2. Research Findings

This section presents the results of how ICT is integrated into teaching and learning within Tanzanian higher education. It is a well-established fact that the application of ICT in education embodies a dynamic relationship between learners, educators, tools, and institutional structures. This study, therefore, examines how lecturers and pre-service teachers perceive the integration of ICT in their teaching and learning experiences, as well as the challenges they encounter.

Additionally, this chapter analyses the rich qualitative data that emerged from nine interviews, categorised into three groups: lecturers: lecturer 1, lecturer 2, lecturer 3, lecturer 4; pre-service teachers: pre-service teacher 1, pre-service teacher 2, pre-service teacher 3, pre-service teacher 4, and a policymaker. The perspectives, the challenges they encounter, and the concerns, are presented comprehensively and linked to relevant theoretical contexts within Sociocultural Theory, and Cultural-Historical Activity Theory (CHAT).

4.2.1 Participants' Demographic Information

The participants of this study consist of lecturers, pre-service teachers and policymakers. Their demographic information is detailed in the following tables:

Table 4.1 Lecturers' demographic information

Name	Gender	Age group	Highest qualification	Faculty	Years of experience
Lecturer 1	Male	50-60	PhD	Education	10+
Lecturer 2	Male	50-60	PhD	Education	10+
Lecturer 3	Female	35-40	PhD	Education	10+
Lecturer 4	Female	40-50	PhD	Education	10+

Table 4.2 Pre-service teachers' demographic information

Name	Gender	Age group	Faculty	Year of study
Pre-service teacher 1	Male	20-25	Education	III
Pre-service teacher 2	Male	20-25	Education	III
Pre-service teacher 3	Female	20-25	Education	III
Pre-service teacher 4	Female	20-25	Education	III

Table 4.3 Policymaker's demographic information

Name	Gender	Age group	Department	Years of experience
Policymaker	Male	45-50	Policy implementation	5-10

The presented participants in the demography disclose the study findings following three research questions. The collected data are from interviews with lecturers, pre-service teachers, and policymaker. Thematic analysis was used to analyze themes and sub-themes that made up common patterns within the data. Major findings on the perceptions and challenges in ICT integration in teaching and learning shared by lecturers and pre-service teachers from higher learning institutions in Tanzania were analysed using thematic coding, and the findings were presented under each research question. Each theme is presented and supported by the voices of the participants. Therefore, the findings from the data collection process, conducted through an online interview, are organised here under the following subcategories, based on the research questions:

4.2.2. Lecturers And Pre-Service Teachers' Perceptions Towards The Integration Of ICT In Teaching And Learning.

A. *Lecturers' perceived benefit towards ICT integration in teaching and learning*

This research question was meant to ask respondents their opinions on how they perceive ICT integration in teaching and learning in the Tanzanian higher education.

When this question was posed to the respondents, the majority of lecturers noted the positive advantages of ICT in teaching and learning. They reported observing ICT as a tool that simplifies work while appreciating the learners who were motivated and exhibited a longer attention span due to using ICT. Regarding lecturers' opinions, lecturer 1 reported:

[“Yes. On my side, I find it very easy when I give a lecture using a projector. Apart from using a projector, I find it easy to conduct an online test. In my class, I have around 1000 students. An online test is easier than using scripts.”]

On the same point, lecturer 4:

[“ICT integration is what I always focus on it. You know the world has changed; everything is done online. There are some programs which are run online.”]

Based on this response, lecturer 4 seems to identify importance of ICT in the education settings.

On the same point, lecturer 3 clings to her firm stand on ICT use by explaining:

[“My opinion in the integration of teaching and learning is that due to the increase in technology nowadays, which is now greater increasing in the world. So, my opinion is that by any means, we need to incorporate it. Especially in the aspect of teaching and learning for example for this is because the technology now is increasing greatly largely so this time for this era or for this time without using technology without incorporating science it's something difficult because everything everywhere you are going it is all about science and technology so for my opinion, I think this is a very important thing during this period of hours.”]

Lecturer 3's stance on the use of ICT in her teaching and learning processes has been greatly contributing to her academic achievement. Moreover, while responding to the same question, lecturer 2 stresses on the contribution of ICT in education. He said:

[“Of course, it contributes a lot because now at a time I can offer an assignment, I can offer a lot of activities by using IT while I am not present at the college, there, even when the students are distant, we can still communicate in various activities. So, this is still useful for me.”]

Again, as reported by lecturer 2, despite the limitations the lecturers face when applying ICT in teaching and learning, they confirm the appropriateness and contributions of ICT in the education system. lecturer 3 observes:

[“..... ICT contributes a lot because now I think that, we have to leave this paper working and still work on IT from every perspective. So, this is still useful for me.”]

He adds:

[“Yes. No one can ignore to use ICT.”]

This underscores that lecturers perceive ICT as an appropriate method in the education system.

Furthermore, while expressing her opinions on how she perceives ICT integration, lecturer 3 said:

[“So, my opinion is that by any means we need to incorporate it. There is no means for this era. You cannot progress well without including or incorporating ICT. Especially in the aspect of teaching and learning for example for this is because the technology now is increasing greatly largely so this time for this era or for this time without using technology without incorporating science it's something difficult because everything everywhere you are going it is all about science and technology so for my opinion, I think this is a very important thing during this period of hours.”]

B. Advantages of ICT

Lecturers have confirmed that using ICT helps them in teaching and other academic issues, such as recording and storing students' information for further use. In this regard, lecturer 3 says:

[“ICT helps us to store the information of our students. You know when we talk about ICT, we include even laptops, phones and computers.”]

Furthermore, from an educational technology perspective, lecturer 2 demonstrates an ICT's advocacy for distance teaching appreciation, especially when the instructor cannot be physically present in the classroom. He said:

[“... I can offer an assignment, I can offer a lot of activities by using IT while I'm not present at the college, there, even when the students are distant, we can still communicate in various activities.”]

Moreover, during discussions, it was also pointed out that ICT plays a big role in simplifying communication among lecturers and pre-service teachers. Regarding this, lecturer 1 explains that:

[“I often use ICT to communicate with my students via social media such as WhatsApp. I integrate ICT in some academic purposes, not all classroom activities. For example, I normally use WhatsApp groups to create groups for my students' seminar presentations. Also, I send some reading materials to my students via the same group. Apart from that, I sometimes use a projector in some class sessions.”]

Correspondingly, without question, lecturer 4 views ICT as a fundamental resource within modern education, both for its communicative value and its ability to engage learners. She observes:

[“Using projector makes easy not only myself, but also my students can see the slides clearly than writing the notes on the whiteboards. However, some students do not take notes, rather they are busy with their phones. Therefore, my opinion is that, technology is very important method in this time. It simplifies the work and it is more efficient.”]

This reflects to what was said by lecturer 2. According to lecturer 2, ICT is a tool that is used in different educational purpose such as assignments. He said:

[“Yeah, I'm using ICT in different perspectives, one during the assessment. Now I can use the LMS to give some assignments, and the student can respond by using it. But also, even the group work can be sent through their group, and they can submit it during the seminar. So, this one is for the teaching as well as for the assessment.”]

In the same way, as responded by lecturer 3, ICT is integrated in educational purposes. Lecturer 3 reports:

[“For me, almost in every aspect of education, like if I want to get a new concept, if I want to get a clarification on a certain concept, I must use these ICT things. So, it is everywhere and whenever I need or I engage in education thing I should use, I should incorporate the ICT.”]

C. Pre-service teachers' perceived benefits towards ICT integration

Regarding the respondents as a whole, the predominant theme among them is the recognition that ICT serves as an important mediating tool that enriches and facilitates educational processes. The pre-service teachers seem to appreciate the contribution made by ICT in their learning processes. pre-service teacher 4 insistently defends the integration of ICT in modern education, contrasting it with learner-centered approaches that rely on printed textbooks and handwritten. To support this, pre-service teacher 4 discloses:

[“Yeah. If you have any question you have to go to a library and find a hard book that you can get information. Therefore, if the book is not found in that library, it means you cannot do anything because your teacher needs the reference. But by integrating ICT, you can search what you want from different engines. Another example is that teachers do not necessarily write the notes on the whiteboard rather they share the slides.”]

Likewise, a confident narration described by pre-service teacher 1 about the relevance of ICT to teaching practice is very straightforward. He admits the time and cost-saving aspects of ICT, mentioning Google Classroom as a platform for conducting examinations and making various resources available in education. He observes:

[“ICT contributes very much. For example, it has contributed to time-saving. It has contributed for us to get various learning materials online. And also, it has helped us to simplify the work of study because we are able to use various platforms which have helped us to get the summaries of various topics and so forth. For example, as you know, the universities have many students. And a teacher can't reach to every student at the same time. So, we are using even WhatsApp as our platform, where various study groups are created there.”]

Again, pre-service teacher 1's judgment towards ICT integration underscores the readiness of pre-service teachers towards ICT integration in educational purposes. Similarly, pre-service teacher 2 explains how ICT contributes to his learning purposes. He says:

[“.... ICT is contributing to my learning purpose. I think when the slide is depicted on the projector, I benefit when the slide is visualized. So, ICT is more important.”]

The same as reported by pre-service teacher 3:

[“Of course, ICT contribute much in our study because, for example, as students we use ICT to find some materials in learning.”]

Similarly, pre-service teacher 2 was heard explaining that:

[“Yeah, it helps me. ICT is contributing to my learning purpose. I think when the slide is depicted on the projector, I benefit when the slide is visualized. So, ICT is more important.”]

D. Environmental support

The context plays a big role in implementing a certain phenomenon. For example, if the context does not support, ICT also cannot be applied effectively. In line with this, pre-service teacher 2 also confirms that they have support from the institution, that help them to use ICT. The access to free Wi-Fi that is provided by university enables them to conduct independent research and learning through multimedia avenues (like watching videos on YouTube). He spots:

[“Yes sir. I think the environment supports the use of ICT yes. The availability of Wi-Fi in some venues. You can use Wi-Fi to search different materials or watch some videos in YouTube for learning.”]

Again, pre-service teacher 1 reports:

[“Yeah of course, it supports because in our classroom there are there are various uh so case which allow us to connect uh electrical appliances and availability of Wi-Fi.”]

Also, pre-service teacher 3 confirms that:

[“Yes, of course internet is free for students because we are not paying for.”]

On the point, pre-service teacher 4 says:

[“Yes, it supports. I can use my phone to search for articles as references to my assignments by using free internet.”]

This implies that, the access to free internet within their context supports ICT integration among students whereby they use ICT in different learning purpose including searching for materials and watching YouTube for learning purpose.

4.2.3 Challenges Faced By Lecturers And Pre-Service Teachers In Integrating Information And Communication Technology In Teaching And Learning

Despite the lecturers and pre-service teacher's stance towards the appropriateness application of ICT integration in the teaching and learning process, there is a recognition of being ICT capacity deficient and seek for undertaking steps to improve infrastructure. This reveals that although ICT is portrayed to be integrated in Tanzanian higher education, there are some sorts of challenges faced by lecturers and pre-service teachers when integrating ICT in classrooms activities. Regarding to their responses, it seems that ICT is not integrated effectively in Tanzanian higher education.

A. Challenges faced by lecturers

As per research findings, in Tanzanian higher education, lecturers face some challenges that lead them to not use ICT effectively.

i) An inadequate of ICT devices

One of the challenges encountered by lecturers when integrating ICT is inadequate of ICT tools. The shortage of ICT tools has been marked as a problematic issue that hampers ICT integration. Lecturer 2 was heard reporting that:

[“..... but the problem is inadequate of ICT tools to support the process.”]

Likewise, lecturer 4 says:

“I always prepare my slides to share with my students. Unfortunately, inside the classrooms there is no a projector to share my slides. The reason is the scarcity of technological instruments.”

She adds:

[“To my side, all conditions which limit me not to apply ICT, I can simply say that are marked as factors that lead me not to use ICT. For instance, I teach history. And I provide some topics to my students. The students are supposed to search for really clips demonstrate such issues through some medias. Unfortunately, we fail to see them in class because of lack of projector.”]

Again, lecturer 1 explains that:

[“Lack of supportive ICT tools, such as a projector and internet. We have a few projectors in our university. We don't have fixed projectors in our classrooms. Also, some classes don't have internet. The Internet is available in some classes.”]

He insisted that:

[“Poor infrastructure to support ICT integration. For example, our department has many students. Some classes have 1000 students. The 1000-student class is held in the tent. It is very difficult to put a projector. The environment is not conducive. If you put a projector in front, the students who sit at the back cannot see what is displayed. Also, in these small classes where we conduct class seminar presentations still no projector and interne.”]

ii) Challenges related to internet access

As the hindrances related to the internet, lecturer 3 presents:

["In our country, we are still growing. Sometimes we face the challenge of accessing the internet that hinders the ICT integration. The issue of internet accessibility leads me not to use ICT."]

Also, lecturer 1 reported that:

["... some classes don't have internet. The Internet is available in some classes."]

iii) A low level of ICT competence among pre-service teachers.

Lecturer 2 confirms in adequate knowledge of ICT among pre-service teachers. He said:

["ICT knowledge is a problem to many students. Most of them prefer to use IT with respect to issues like moving, and so on, but in the academic issues, they meet some challenges. Another challenge faced by these learners is lack of support when they attend teaching practice. Through my observation, even because as you know, that I'm the chairman of the Islamic school in this country. So, I used to make a visit physical to see how the schools are operated. One of the problems is that they cannot use ICT."]

As reported by Ke, et al. (2022), in the world today, teachers are facing more obstacles in support of deeper and more complicated student learning as mandated by various reforms and policies in the area of education. But the difficulties encountered by teachers in teaching, which are grounded by students cannot be considered as an excuse, rather there is in need of employing a professional development. Quality professional developments (PD) programs are the backbone of preparing teachers for these expectations (Ke, et al., 2022).

B. Challenges faced by pre-service teachers

As it was reported during the discussion, the factors that disturb pre-service teachers when integrating ICT include challenges related to internet access, an inadequate number of ICT devices and a low level of ICT competence.

i) Challenges related to internet access

Regarding the issue of the internet, pre-service teacher 1 said:

["... The lack of strong internet is a big problem. Also, in our university, some classrooms do not have internet."]

Correspondingly, pre-service teacher 1 reports that:

["I think the challenge is the low qualities of accessing the internet. I think it is one of the challenges"]

He adds:

["As I said, the internet is not stable. Also, some venues do not have internet access."]

This report reveals that, despite having free internet, learners are not comfortable with the infrastructure.

ii) A low level of ICT competence

Apart from weak internet the learners experience, it has been reported that the learners face the challenge of inadequate knowledge to use ICT effectively. This situation leads them to not using ICT. pre-service teacher 1 says:

["For my side I can say that the knowledge that I have concerning ICT is limited. I know some. But I continue to learn more about technology."]

From the same point of view, pre-service teacher 2 explains:

[“No. I am not good enough. Maybe If we are in group then we help one another to prepare slides.”]

Additionally, pre-service teacher 2 said:

[“Actually, another challenge is among the students who are not aware of these ICT process. For example, there are some apps which we have to install for the different meetings with the students. Some of them do not install in their phones since they are not aware of how they use it.”]

This was also reported by pre-service teacher 2:

[“Somehow. I can use ICT especially in searching some information when I respond the questions given by our lecturers or something like that.”]

Again, while responding the same question related to ICT knowledge and skills, pre-service teacher 4 said:

“Somehow not much”

It truly reflects socio-technical hindrances.

iii) An inadequate number of ICT devices

This highlights the influence of institutional rules and cultural regimes that are explicitly incorporated by CHAT as fundamental constituents of activity outcomes. In this case, pre-service teacher 2 was heard saying that:

[“Lack of facilities for example, many schools in secondary schools or in primary schools they are lacking those facilities. There is no electricity and internet. Also, secondary school students are not allowed to use phones.”]

Pre-service teacher 2’s report pinpoints the challenges that restrict pre-service teacher to incorporate ICT in their teaching processes during teaching practice.

Along with this line, pre-service teacher 4 also draws attention to the examination ICT policy restrictions, specifically the banning of phones and laptops, which greatly limits the integration of ICT in assessment. She observes:

[“For example, in that school that I attended my teaching practice the students are not allowed to own phones and laptop. Also, no computers in classrooms. Another thing that hampers ICT integration is lack of electricity and internet access around the school compounds.”]

Her mention of university buildings like computer labs and Wi-Fi linked to ICT infrastructure represent poor infrastructure.

Pre-service teacher 3 also points out to the sample ICT policy prohibitions where pupils cannot use their phones and laptops, making it more difficult for ICT to enter into the assessment. pre-service teacher 3 said:

[“..... I used my phone to play some audios and showing some videos which were relating to specific topics. But I could not able to conduct an online exam. Because students do not have phones or laptop.”]

From this point of view, the environment seems to restrict the integration of ICT in secondary school during teaching practices held by pre-service teachers.

4.2.4 Tanzanian Policy In Supporting ICT Integration In Tanzanian Higher Education.

The ICT policy pertaining to Tanzanian higher education systems particularly focuses on the use of technology in automating academic processes as well as improving the efficiency of the

corresponding activities. A policymaker's account as reported by policymaker sheds much light not only on the purposes of the policy but also the challenges underlying its actual execution.

A. Understanding of ICT Policy in Tanzanian higher education.

Based on policymaker's understanding, ICT policy is considered as initial and important to the contemporary education system. Policymaker says:

[“As far as the Tanzania education policy is concerned, ICT policy is very important and it has been so much insisted in getting that policy in such a way that in all school firms that there must be use of automated ICT programs such as use of automated tables tracking systems that allow teachers or students to learn to be digitalized. Also, it has been insisted that there must be online grade books to be used, I mean to record your calculated grades so that all records must be automated and must be available. So, all these higher learning institutions have to use ICT.”]

He adds:

[“Yes, it fits the current generation in several ways because nowadays each and everything is digitalized, each and everything is automated, so it fits to this generation because nowadays we say we are in the digital era. So, each and everything is automated, so the new generation, or this current generation lives in this digitalized world. So, I can say that it fits.”]

In connection to sociocultural theory, this implies how policy performs as a cultural instrument that facilitates organizational habits and establishes anticipation for application.

B. Policy implementation in Tanzanian higher education.

ICT policy is applied in different ways: policymaker says:

[“... .. ICT policy is implemented in several ways whereby in all schools and university, they ensure that there is a use of automated attendance tracking systems to allow teachers to record attendance digitally. Also, there is online grade books that can be used to record and calculate grades providing centralized in an accessible platform. Apart from that they utilize the automated scheduling tools to create and the manage class schedules exams and the other events on other hand it is also implemented by ensuring that there are online payment systems whereby technology facilities online payments are used to ensure that school fees or university fees are paid digitally in order to reduce the reliance on manual transactions. So, this is to show how this policy is being implemented in the Tanzania higher institutions.”]

C. Challenges faced by policymakers in Policy implementation

On top of that, despite the different ways the policymakers apply to ensure that ICT policy is effectively implemented, there are some obstacles they face. Policymaker says:

[“I think there are various challenges, but the main one is the readiness. First of all, is the technology. Some of our people are well knowledgeable about using this technology, ICT technology. Unfortunately, they are not ready to change. So, they're still remaining with the archaic technology, that is. Another obstacle which I think is very important, ICT policy is hindered much by our environment. When I say environment, I say there is obstacle, lack of electricity, in saying in a huge area of Tanzania, the electricity is not there, as all ICT facilities need the use of electricity. Without electricity, it means it appears to be a big obstacle of using ICT technology.”]

Again,

“Using ICT is very good, and it's very, very, very beneficial. Unfortunately, I can say we have entered into this, into the use of technology without a thorough preparation that it would be better if we would have provided a good environment of ensuring that each and everything can be easily used in this technology by establishing the electricity and preparing our people by imparting knowledge to them so that they can be ready to use

this technology without any problem. But because there is no knowledge of using technology, there was no preparation of who is turning electricity to several parts of our country. So, you'll find that there are some areas which are woody using the technology, but some of our societies are left behind because of no power, no knowledge of using the ICT, ICT facilities, that is my addition."

Policymaker agrees with real Tanzanian situation whereby ICT cannot be integrated effectively.

4.3 Discussion

The research results on exploring the integration of information and communication technology in teaching and learning in Tanzanian higher education, as presented above in this chapter, are discussed based on research questions as follows:

4.3.1 Lecturers And Pre-Service Teachers' Perceptions Towards The Integration Of ICT In Teaching And Learning.

The first research question aimed to seek information from the respondents regarding their perception on how they perceive the Integration of ICT in Teaching and Learning in Tanzanian higher education. To respond to this question, the discussion between the researcher, lecturers and pre-service teachers was conducted to understand how ICT integration in teaching and learning is perceived by lecturers and students. Therefore, the discussion regarding this question is categorised into two subsections, namely, lectures' perceptions and pre-service teachers' perceptions as detailed below:

A. Lecturers' perceived benefits towards ICT integration in teaching and learning

When this question was asked to the lecturers, based on their responses, I found that ICT is an appropriate tool when it is used in teaching and learning. Dr. Twaha outlines a more nuanced perspective about ICT that appreciates its advantages as well as its limitations relative to large classrooms. During the discussion, it was discovered that despite the limitations the lecturers face when applying ICT in teaching and learning, they confirm the appropriateness and contributions of ICT in the education system. Dr. Twaha observes:

This underscores that lecturers perceive ICT as an appropriate method in the education system. Furthermore, while expressing her opinions on how she perceives ICT integration, Dr. Ziada said:

[“..... by any means we need to incorporate it.....”]

From this point of view, lecturer 3's perceptions towards ICT integration remarks to the appropriateness of ICT in educational career. This stresses that the current education system has been transformed from a traditional method to ICT integration. In line with this, Nkula and Krauss (2014) argue that the provision for access to better education for all has made a meaningful transformation, that ICT serves as an energetic instrument in teaching and learning. The confirmation of appropriateness of ICT use in education is also supported by Saeed (2017) who confirms that professionals of organizations and their knowledge of ICT impacts to the better education as it results into the quality of education. Additionally, according to Saeed (2017), based on the current things that one can anticipate, it is very clear that the information technology

will be ruling the day-to-day lives. Thus, many educational institutions across the world work on improving infrastructure and teachers' training to effectively use of ICT in the educational landscape.

B. *Advantages of ICT*

Lecturers have confirmed that using ICT helps them in teaching and other academic issues, such as recording and storing students' information for further use. In this regard, lecturer 2 says:

[“.....ICT helps us to store the information of our students.....”]

Lecturer's explanation aligns with Lund (2012), who asserts that any tool that can be used to enhance learning, such as computers, tablets and phones, is defined as ICT. In turn, those computers, laptops and phones are used to collect and store information. In line with this, Freeman and Hasnaoui (2010) Information and Communication Technology (ICT) is the use of technologies in collecting, editing, storing, and passing information in numerous systems. Therefore, based on the lecturer's responses, I may conclude that the lecturers perceive IT positively.

Furthermore, from an educational technology perspective, lecturer 2 demonstrates an ICT's advocacy for distance teaching appreciation, especially when the instructor cannot be physically present in the classroom. He said:

[“... I can offer an assignment, I can offer a lot of activities by using”]

This underscoring of social, informal, and technologically rooted tools that demonstrate how mobile messaging apps may serve as socio-technical mediators—transforming physical separation into virtual learning spaces (Vygotsky, 1978). His practice exemplifies the community and division of labor aspects of the CHAT framework, in which communication technologies allow students and lecturers to participate in knowledge construction beyond formal classroom settings. lecturer 2 point of views aligns with Mittler (2007) who clings with firm stand that ICT plays a big role in reducing learner's barriers to the learning process. The learners' ability is also argued to be promoted by ICT use in classrooms.

On the same point, lecturer 3 shares a more developing view of instructional technologies in relation to educational reforms and international benchmarks. She said:

[“..... I think this is a very important thing during this period.....”]

lecturer 3's opinions towards ICT integration in teaching and learning opens people's mind that in this digital era, ICT integration is inevitable. According to lecturer 3, despite the setback that both lecturers and pre-service teachers encounter while utilising ICT in educational purpose, still, ICT plays a big role in educational platform. Thus, Alemu (2015) study findings emphasised that despite the challenges faced by teachers and students in integrating ICT in schools, there is a need of having some tensions on the matter.

Correspondingly, without question, lecturer 4 views ICT as a fundamental resource within modern education, both for its communicative value and its ability to engage learners. She observes:

[“Using projector makes easy not only myself, but also my ...”]

This aligns with sociocultural theory’s position that tools used within traditional learning mediates the processes, making teaching and learning more active and student-centered. Lecturer 4 discourages traditional methods that is still involved in this world of technology. She acknowledges the contribution of ICT integration in the educational purpose. During discussion, lecturer 4 was quoted saying that:

[“..... You know the world has changed, everything is done online.....”]

In regard to lecturer 4 awareness towards the contribution to ICT integration in teaching and learning to promote the important role of teacher in the integration of ICT. Teachers’ beliefs about the importance and value of integration of ICT in education is one of the key factors in successful technology infusion. This is parallel to what was reported by Rahimi and Tafazoli (2022).

According to Rahimi and Tafazoli (2022), the effective management of classes needs educators to be highly digitally competent, especially in this digital era where the enormous integration of ICT in the education system including higher education is every day getting credits. Across all four participants, there is consensus that ICT serves as transformative tools, enhancing communication and access to information.

C. ICT integration in teaching and learning in Tanzanian higher education

As it was confirmed by Kiwonde (2024) that the integration of ICT in teaching and learning in Tanzanian education settings is currently acknowledged by Tanzanian educators, also, the lecturers and pre-service teachers confirm that ICT is integrated in Tanzanian higher education. Despite the hinderances encounter the lecturers when integrating ICT in teaching and learning, ICT gets recognition from all lecturers who were interviewed. During discussion, ICT has been greatly discovered significantly in the process of learning whereas it promotes social interaction within a context. This is also constituted to Vygotsky (1978) that every cognitive function starts from and is shaped by social interactions, which has been proven that learning in a vacuum, as many scholars have suggested, is practically impossible.

In this regard, both lecturers and pre-service teachers tend to cooperate in their every teaching and learning daily routine activities. In connection to this, CHAT provides us with a philosophical and cross-disciplinary lens for analysing different human uses as development processes where individual and social levels are intertwined (Igira, 2009). ICT is used in different educational purposes to link between lecturers and pre-service teachers, such as communication and uses of projector in class. Lecturer 1 was quoted saying:

“...I often use ICT to communicate with my students via social”

From this point of views, lecturers seem to acknowledge the value of integrating ICT in classrooms by stressing the position of ICT as it simplify to enhance students' accomplishments of their tasks. In line to this Ghavifekr and Rosdy (2015) report that information and communication technology promotes students' collaborative learning skills in solving the problems as well as self-determinant in responding to their duties.

This is reflecting to what was said by lecturer 2. According to lecturer 2, ICT is a tool that is used in different educational purpose such as assignments. He said:

[“Yeah, I'm using ICT in different perspectives,”]

In the same way, as responded by lecturer 3, ICT is integrated in educational purposes. lecturer 3 repots:

[“For me, almost in every aspect of education....”]

Additionally, lecturer 4 observes that:

[“Yes. I use ICT in teaching process.”]

With reference to what have been responded by lectures, stresses that, ICT is integrated in Tanzanian higher education. The lecturers try to force themselves to utilise ICT in educational drives to match with the real-world situation. This is parallel to Gu et al. (2013) claims, it is argued that the rapid growth and development of ICT opens a door for teachers to use ICT in teaching.

D. Pre-service teachers' perceived benefits towards ICT integration

Regarding the respondents as a whole, the predominant theme among them is the recognition that ICT serves as an important mediating tool that enriches and facilitates educational processes. These perceptions find supporting expressions in Vygotsky's Sociocultural Theory, which asserts that learning is mediated by cultural artifacts, tools, and social interaction within a community, not to mention CHAT's understanding of activity systems for the relationships among subjects, tools, rules, community, and division of labour.

The pre-service teachers seem to appreciate the contribution made by ICT in their learning processes. For example, pre-service teacher 4 insisently defends the integration of ICT in modern education, contrasting it with learner-centered approaches that rely on printed textbooks and handwritten. To support this, pre-service teacher 4 discloses:

[“... But by integrating ICT,.....”]

Likewise, a confident narration described by pre-service teacher 1 about the relevance of ICT to teaching practice is very straightforward. He admits the time and cost-saving aspects of ICT, mentioning Google Classroom as a platform for conducting examinations and making various resources available in education. He observes:

[“ICT contributes very much.”]

The presence of technological tools is said to transform traditional educational practices into spaces for new kinds of interaction and learning. Similarly, Williams (2010) claims that the internet in this 21st century has changed the people's communication system. The very act of

using WhatsApp to facilitate a study group is essentially a social media platform acting as a cultural tool that mediates collaborative learning beyond physical borders. It is within this perspective that student self-organisation through the ICT becomes comprehensible in a concept of community and division of labour, as set forth by Vygotsky (1978) concern that learning is a social activity. It further emphasises how such interactions may lead to cognitive growth if the learner is assisted by ICT integration with the help of students- students and students-teachers interaction. Thus, it is in these views, students are observed actively in grouping themselves using digital aids to assist their peers in learning.

Again, pre-service teacher 1's judgment towards ICT integration underscores the readiness of pre-service teachers towards ICT integration in educational purposes. Pre-service teacher 1's views bring into line with Al-Shboul et al. (2017) who present that the willingness of students to adopt new technology in schools leads into the ICT utilisation in teaching and learning. In this regard, the readiness of pre-service teachers towards ICT integration in educational purposes indicates ICT as a modern teaching and learning method that has transformed traditional learning methods and strategies at different levels of education in many countries (Selemani et al., 2021). Similarly, pre-service teacher 2 explains how ICT contributes to his learning purposes. He says:

[“ ICT is contributing to my learning purpose... ”]

The same as reported by pre-service teacher 3:

[“Of course, ICT contribute much ”]

Regarding to these responses, ICT emphasises promotion to multimodal learning, which involves the use of ICT to enhance understanding through visuals that, according to sociocultural theory, mediate cognitive development using cultural tools (Vygotsky, 1978). Notably, pre-service teachers identify a gap in students' ICT engagement, advocating for collaboration in preparing presentations, thereby illustrating social learning. This collectivism exemplifies a collective scaffolding of sociocultural contexts. The explanation made by pre-service teacher 2 aligns with Vygotsky (1978) who asserts that learning is not solely a factor of the individual, but rather develops in social context.

D. Environment support

The context plays a big role in implementing a certain phenomenon. For example, if the context does not support, ICT also cannot be applied effectively. In line with this, pre-service teacher 2 also confirms that they have support from the institution, that help them to use ICT. The access to free Wi-Fi that is provided by university enables them to conduct independent research and learning through multimedia avenues (like watching videos on YouTube). He spots:

[“.. the environment supports the use of ICT ”]

Again, Mr. Abdi reports:

[“ ... it supports ”]

Also, pre-service teacher 3 confirms that:

[“Yes, of course internet is free for students”]

This implies that, the access to free internet within their context supports ICT integration among students whereby they use ICT in different learning purpose including searching for materials and watching YouTube for learning purpose.

4.3.2 Challenges Faced By Lecturers And Pre-Service Teachers In Integrating Information And Communication Technology In Teaching And Learning

Despite the lecturers and pre-service teacher’s stance towards the appropriateness application of ICT integration in the teaching and learning process, there is a recognition of being ICT capacity deficient and seek for undertaking steps to improve infrastructure. This reveals that although ICT is portrayed to be integrated in Tanzanian higher education, there are some sorts of challenges faced by lecturers and pre-service teachers when integrating ICT in classrooms activities. Regarding to their responses, it seems that ICT is not integrated effectively in Tanzanian higher education.

Ineffective integration of ICT observed from Tanzanian higher education is grounded with poor infrastructure within school environment. With regard to learning experiences Hall (2007) describes what sort of environment the learner needs to be able to grow cognitively. Furthermore, it is suggested that once the environment for learning has the right level of support from others, the learner develops cognitively (Hall, 2017).

Unfortunately, as reported by lecturers and pre-service teachers, the environment (infrastructure) hinders the smooth use of technology in teaching and learning activities in Tanzanian higher education. The lack of consistency in infrastructure such as poor internet quality and lack of projectors as reported by lecturers hamper the use of ICT in classrooms. for example, if the Wi-Fi position is of poorer quality, it causes difficulties to users to reach the internet services effectively.

A. Challenges faced by lecturers

The barriers relating to ICT integration are those hindrances that impede the incorporation of ICT into teaching and learning by teachers as well as students. One of the barriers that hamper ICT integration in teaching and learning is a low level of ICT competence faced by teachers. Gumartifa (2016) reports that teachers’ ICT incompetence is a big challenge for teachers’ response towards ICT implementation because of a lack of confidence. In this regard, it reaches to the extent that most teachers who are troubled with little understanding of the use of ICT incline to skip ICT integration in classrooms.

In this study, under this research question two, the researcher discovered that lecturers are well equipped with ICT knowledge and skills as they use ICT in different ways that relating to

teaching and learning. However, regarding to the research findings, there are some barriers arised during discussion such as limitation of infrastructure.

As reported by Habibi et al., (2018), the infrastructure limitation could be the strongest barrier to ICT integration in the education system. In this study, participants who generally reported cases concerning poor infrastructure were those mainly involved in applying ICT integration in their teaching practices at higher educational institutions whose facilities were not adequately supported.

i) An inadequate of ICT devices

One of the challenges encountered by lecturers when integrating ICT is inadequate of ICT tools. The shortage of ICT tools has been marked as a problematic issue that hampers ICT integration. Lecturer 2 was heard reporting that:

[“..... but the problem is inadequate of ICT tools”]

Likewise, lecturer 4 says:

[“..... Unfortunately, inside the classrooms there is no a projector”]

She adds:

[“..... Unfortunately, we fail to see them in class because of lack of projector”]

According to Klapproth (2020), a major obstacle to effective instruction identified by most teachers is inadequate computer equipment and poor internet connectivity. This highlights that the successful integration of ICT in today's education system heavily depends on having the necessary digital infrastructure. Lecturers report that insufficient numbers of computers hinder their teaching. Again, Lecturers note that most Tanzanian schools and higher education institutions lack basic resources such as computers, projectors, smart boards, and other digital devices. Consequently, the shortage of ICT devices, as explained by these respondents, prevents teachers from delivering lessons that include multimedia learning, online resources, or digital assessments and essential components of modern pedagogy. Even highly motivated teachers struggle to utilise innovative teaching methods with ICT because the required facilities are unavailable.

To meet these challenges, ICT has become imperative rather than optional; therefore, inaction on the part of stakeholders in education now would lead to more difficult circumstances at a later time. Governments and education institutions must ensure close attention to ICT infrastructure investment, as it is only with modern technologies, including high-speed Internet access, that learning can occur at the primary and secondary levels. Partnership with the private sector should also extend to affordable devices and connectivity solutions. Schools should also put in place digital inclusion strategies to ensure that every teacher and learner has all the necessary tools and skills to navigate the new technology-focused classroom environment. It is through such target interventions that ICT can attain true meaningfulness, equity, and sustainability in the 21st century.

ii) Challenges related to internet access

Similarly, lecturer 3 presents:

[“... we face the challenge of accessing the internet”]

With reference to lecturer's claim, poor internet connectivity has emerged as another significant barrier in many learning environments. Teachers find it difficult to access learning materials, communicate with students online, or use digital platforms for teaching or assessment when the internet connection in the classroom is unreliable. This is in line with Yeh (2022) who claims that the access to an erratic or insufficient internet connection has rendered both the teachers and students helpless in directing their learning processes through internet, which in turn has severely frustrated students' rights in online education. The situation is particularly dire in small rural or unserved areas where network infrastructure is either undeveloped or nonexistent. However, this problem is also reported in urban areas. As a result, the promises of ICT to enhance student engagement and digital literacy with broader, global knowledge remain largely unfulfilled.

iii) A low level of ICT competence among pre-service teachers.

Lecturer 3 confirms in adequate knowledge of ICT among pre-service teachers. The low level of ICT knowledge and skills acts as a hindrance in ICT integration. Thus, to improve ICT utilization in teaching and learning effectively Gumartifa (2016) suggest that before ICT is integrated into the classroom, there is a need for teachers to become knowledgeable on the application of ICT into classroom practices. Pointedly, the teachers' ICT knowledge and skills support teachers to utilise ICT effectively and be able to handle the barriers of ICT integration. Contrary, inability of ICT skills in teaching leads to ineffective utilization of ICT.

This aligns with Alkahtan (2017) who claim that both students and teachers lack the fundamental understanding of how the equipment works, and other deficiencies appear, such as the lack of ICT teaching techniques masteries and of teacher training to fill the gap; lack of electronic equipment mastery; and problems of repairs-or the timeliness of that are shortcoming key players encountered by teachers and students in integrating ICT in education purposes.

Furthermore, as per Vygotsky (1978), using a projector with PowerPoint, smartphones, and access to the internet for communication serves as a cultural tool that aids explanation or understanding. Unfortunately, Mou (2016) argues that despite the trends of information and communication technology to change the traditional education system, many teachers still do not use ICT effectively. The existing situation of lack of knowledge and skills to ICT use faced by many lecturers may lead to poor-quality educational outcomes, as anticipated after the shift from traditional education to ICT integration. Therefore, to address this situation, Zafar (2019) firmly states that to overcome the drawbacks faced by key actors in ICT integration, knowledge economics—by its definition—requires educational institutions to produce graduates who, at the very least, possess the prerequisite IT qualifications and other competitive skills.

B. Challenges faced by pre-service teachers

According to Santos and Castro (2021), for ICT integration in teaching and learning, pre-service teachers need to possess technological pedagogical skills. Technological Pedagogical Content Knowledge (TPACK) relates to how well lessons incorporate technology (Santos and Castro, 2021). This is intended to apply to all aspects of learning, as each is necessary in the teaching-learning process. In the work conducted by Santos and Castro (2021), cooperating teachers evaluated pre-service teachers, supported by interviews with both the pre-service teachers and their supervisors. Santos and Castro (2021) assert that according to the study findings, pre-service teachers have strong knowledge about all seven elements of TPACK. Unfortunately, as it was reported during the discussion, the factors that disturb pre-service teachers when integrating ICT include challenges related to internet access, an inadequate number of ICT devices and a low level of ICT competence.

i) Challenges related to internet access

Regarding the issue of the internet, pre-service teacher 1 said:

[“... The lack of strong internet is a big problem.”]

Correspondingly, pre-service teacher 3 reports that:

[“..... the low qualities of accessing the internet...”]

She adds:

[“..., the internet is not stable....”]

This report reveals that, despite having free internet, learners are not comfortable with the infrastructure. The internet is so weak that it cannot support all students at once due to the large number of learners. ICT integration requires a strong internet connection. However, when the internet is unstable, it results in poor service because it operates slowly and sometimes fails to connect when many devices are connected at once. Additionally, it may take an excessive amount of time to open certain links. Therefore, the infrastructural issues, such as weak internet, indicate barriers for pre-service teachers in integrating ICT into their learning activities. Bahinting, et al. (2022) describe this as one of the hurdles confronting students. This pinpoints that students who find the internet inaccessible are faced with a difficulty towards learning (Casillano, 2019) in Bahinting, et al. (2022).

ii) A low level of ICT competence

According to Uffen, et al. (2022), in line with the CHAT perspective, a lesson study can offer significant learning opportunities by fostering innovative and new teaching and learning practices, which are sometimes not even foreseen in advance. Since learning can vary greatly for each participant and can even be unexpected, we prefer to consider teacher learning in a broad sense, defining it as any outcome that involves changes in cognition and behaviour. Thus, apart

from weak internet the learners experience, it has been reported that the learners face the challenge of inadequate knowledge to use ICT effectively. This situation leads them to not using ICT. Pre-service teacher 2 explains:

[“No. I am not good enough. Maybe If we are in group then we help one another to prepare slides.”]

Additionally, pre-service teacher 2 said:

[“...is among the students who are not aware of these ICT process.”]

It truly reflects socio-technical hindrances. That is, there is both the availability of tools or resources and the development of skills to operate them, as both aspects are interconnected and determine the capacity for ICT adoption. This aligns with Al-Mamary (2022) who confirms that there is a need of an availability of tools or resources alongside skills development that determines their adoption for ICT, because both are mutually exclusive.

Availability of tools or resources coupled with development of skills-use determined by both for capacity in ICT adoption: availability of tools or resources and capacity for the adoption by an individual person (Al-Mamary, 2022). Under this circumstance, therefore, as proposed by Al-Mamary (2022), teachers and students are required to develop ICT knowledge and skills along with tools or resources, offering the connection between both aspects and the capacity in ICT application.

iii) An inadequate number of ICT devices

According to Al-Mamary (2022), having tools and resources would include sharpening skills to operate those tools for both aspects interconnected and determined for capacity in ICT adoption. Accordingly, ICT is given, as well as development skills to operate it depends on the availability of ICT tools. Along these lines, pre-service teacher 2 further enumerates the policies and contextual barriers that exist within secondary schools independently, such as restrictions on cell phone use by students and the lack of electricity, which simply prevents any such use of ICT during teaching practices.

This thus highlights the influence of institutional rules and cultural regimes that are explicitly incorporated by CHAT as fundamental constituents of activity outcomes. In this case, pre-service teacher 2 was heard saying that:

[“..... There is no electricity and internet...”]

Pre-service teacher 2's report pinpoints the challenges that restrict pre-service teacher to incorporate ICT in their teaching processes during teaching practice. In relation to this, pre-service teacher 3's discussion of university facilities such as computer laboratories and Wi-Fi associated with ICT infrastructure demonstrates investment on the part of the institution. Nonetheless, she does highlight the disproportionate ratio of students to computers, which restricts practical training sessions.

This highlights a deeper problem within the activity system where lack of adequate tools resources results in unequal ICT accessibility and usage. This aligns with Habibi et al., (2018), the infrastructure limitation could be the strongest barrier to ICT integration in the education system. In this study, participants who generally reported cases concerning poor infrastructure were those mainly involved in applying ICT integration in their teaching practices at higher educational institutions whose facilities were not adequately supported.

Along with this line, pre-service teacher 4 also draws attention to the examination ICT policy restrictions, specifically the banning of phones and laptops, which greatly limits the integration of ICT in assessment. This underscores the CHAT idea of “rules” constraining what activities may take place, as well as what tools can be utilized, within specific educational settings. She observes:

[“.... students are not allowed to own phones and laptop...”]

Her mention of university buildings like computer labs and Wi-Fi linked to ICT infrastructure represent poor infrastructure. This draws attention to a deeper contradiction of the activity system, the asymmetry of ICT accessibility and use, due to the inadequate tools resources. In this context, her support of the role of ICT implies that these students and teachers realize its potential as a transforming agent in the education process, which aligns with sociocultural perspectives of tool use focused on mediated learning. However, the environment does not support. Thus, ICT is not applied in secondary school contexts.

Pre-service teacher 3 also points out to the sample ICT policy prohibitions where pupils cannot use their phones and laptops, making it more difficult for ICT to enter into the assessment. This highlights the CHAT notion of "rules" limiting what This highlights the persistent underlining imbalance within the activity system, in which the rules and policies governing support for ICT are lacking support remain insufficient and ineffective leading to integration of teaching through technology frameworks. Pre-service teacher 3 said:

[“...students do not have phones or laptop.”]

As the environment restrict the integration of ICT in secondary school during teaching practices held by pre-service teachers, likewise, in Tanzanian higher education lecturers face some challenges that lead them to not use ICT effectively. Lecturer 4 says:

[“.... because of lack of projector.”]

Lecturer 4’s claims pinpoints that some students do not have ICT tool such as computer. Accordingly, not every student from a low social status has access to devices such as computers and the internet (Cleofas & Rocha, 2021).

iv) Challenges related to internet access

Lecturer 4 presents:

[“... we face the challenge of accessing the internet”]

Whereas lecturer 2 confirms in adequate knowledge of ICT among pre-service teachers. He said:

[“ICT knowledge is a problem to many students...”]

Regarding to these few remarks by lecturers, it is observed that despite the introduction of ICT integration in teaching and learning in Tanzanian education system, there are some areas where ICT is integrated though it is not effectively. Meanwhile, some areas do not integrate ICT at all. Under this circumstance, some pre-service teachers do not make efforts to learn more about ICT knowledge and skills. Thus, in every one school, there is only one teacher who is capable of using ICT tools (Selemani et al., 2021).

Therefore, as suggested by Mou (2016) that to improve teachers training and policy-making can help to address all the concomitant barriers hence the success of ICT in education, the government should take measures to address the matter. Otherwise, ICT cannot be integrated effectively. This is because Benali et al. (2018) reveals that the learners' digital content seems to be more advanced. Therefore, it needs more improvement for the official teachers' professional development.

4.3.3 Tanzanian Policy In Supporting ICT Integration In Tanzanian Higher Education.

The ICT policy pertaining to Tanzanian higher education systems particularly focuses on the use of technology in automating academic processes as well as improving the efficiency of the corresponding activities. A policymaker's account sheds much light not only on the purposes of the policy but also the challenges underlying its actual execution. A Sociocultural Theory and Cultural Historical Activity Theory (CHAT) analysis reveals the interplay between policy as a mediating device and as a structural element within the educational activity system. This pertains to the focus on policies as constituent cultural frameworks from the Sociocultural viewpoint that constructs and regulates actions within institutions and dictates social expectations for practices at school. The preferring of automatization of certain activities, such as setting up automated attendance systems, electronic grade books, and scheduling systems, marks the effort aimed towards fostering a digitally receptive learning culture.

Analyzing from CHAT, this policy is what constitutes a 'rule' in the activity system. It provides a specific set of boundaries defining how roles (lecturer, administrator) are expected to operate within prescribed limits (use of ICT tools) to achieve the objectives of modern and effective education. Also, the description captures the intention of some change being made.

A. Understanding of ICT Policy in Tanzanian higher education.

Based on policymaker's understanding, ICT policy is considered as initial and important to the contemporary education system. Policymaker says:

[“... is very important”]

In connection to sociocultural theory, this implies how policy performs as a cultural instrument that facilitates organizational habits and establishes anticipation for application.

B. Policy implementation in Tanzanian higher education.

ICT policy is applied in different ways: Policymaker says:

[“..... ICT policy is implemented in several ways”]

Regarding to this response, ICT policy is concerned with making follow-up to ensure that the policy is applied effectively. But ICT policy does not support to the large extent ICT integration as it focuses on setting some initiatives and watch how they are complemented. This implies that, ICT policy does not provide any ICT tool in Tanzanian higher education. Therefore, if a certain university is faced with poor infrastructure that hamper ICT integration is not its concern.

C. Challenges faced by policymaker

On top of that, despite the different ways the policymakers apply to ensure that ICT policy is effectively implemented, there are some obstacles they face. Policymaker says:

[“.... Unfortunately, they are not ready to change...”]

Policymaker agree with real Tanzanian situation whereby ICT cannot be integrated effectively. Therefore, they sometimes decide to live line with the situation. Under this circumstance, ICT policy is not implemented effectively because of some commonness in Tanzanian contexts. In effective ICT implementation underscores inappropriateness that needs improvement. Therefore, the policy does not support ICT integration in Tanzanian higher education.

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents the results of the study and offers recommendations based on those findings as suggestions that further research or applications might consider for improvement. It highlights improvements correlated to ICT incorporation in Tanzanian higher instructions. This consequently sets the stage for the recommendations section, which suggests potential avenues for future research and actions that educational institutions and policymakers might work on to improve ICT application in the Tanzanian education system.

5.2 Conclusion

Based on the findings of this study, the following conclusion is made regarding ICT integration in Tanzanian higher education. Lecturers, pre-service teachers and policymakers who were the respondents of this study have provided more information about the real situation concerning the integration of ICT in Tanzanian higher education. It is revealed that ICT integration in Tanzanian higher education is not applied effectively. This is grounded with the sorts of challenges encounter the integration of ICT in Tanzanian education sectors. This has been observed during discussion between the researcher and the research participants. Both lecturers and pre-service teachers confirm to the presence of many obstacles that hamper ICT integration in Tanzanian higher education.

In adequate knowledge of ICT skills act as obstacles that leads to pre-service teachers do not use ICT effectively. This situation leads to the extent that pre-service teachers complete their bachelor degree while incompetent in utilizing ICT effectively. On the other hand, as reported by lecturers, the school environments provide significant contribution on the absence of ICT utilization in teaching and learning. The poor infrastructure has become a problem to them. In adequate projectors result into writing the lesson notes on the white board instead of being projected.

Regarding the research question one, in answering the questions posed to them concerning their perceptions towards ICT integration in teaching and learning, the lecturers agreed that ICT is a viable tool for teaching and learning. Despite all limitations that lecturers encounter in applying ICT in teaching and learning, Lecturer adopts a more subtle view of ICT that embraces its advantages and shortcomings concerning large class sizes. Whereas in the course of the discussions, it became clear that the ICT applications gave an opportunity and enhancement to education.

From this perspective, lecturer 3's perceptions towards ICT integration remarks to the appropriateness of ICT in educational careers. This strongly insists that the current education

system transformed from traditional ways to ICT integration. Lecturer 3's opinions towards ICT integration in teaching and learning open people's minds that ICT integration is mandatory in this day and age. As per lecturer 3, in spite of the setback that both lecturers and pre-service teachers encounter while utilising ICT for educational purposes, ICT still forms an integral part of the educational platform.

Correspondingly, based on the second research question, which was meant to know the challenges faced by lecturers and pre-service teachers, there is a feeling among the lecturers and pre-service teachers that, on the whole, the use of ICTs in teaching and learning ought to be well integrated. Unfortunately, in terms of practice, however, they find ICT capacity wanting and seek to take steps toward improving the infrastructure.

An ineffective integration of ICTs evident in Tanzanian higher education is deeply anchored in poor infrastructure in the school environment. This means that, although ICT is articulated to be integrated in Tanzanian higher education, somehow it is found to be challenging by the lecturers and pre-service teachers in classroom activities. This poor infrastructure, as reported by the lecturers and pre-service teachers, hinders the smooth application of technology in the teaching-learning activities in Tanzanian higher education. According to the lecturers, the irregular nature of infrastructure, such as poor internet connectivity and lack of projectors, creates a lot of hindrances in the use of ICT in classrooms." From the sound of it, ICT is not effectively integrated into Tanzanian higher education.

On top of that, regarding the third research question, it aimed to explore the support of policy in ICT implementation. ICT policies regarding higher education in Tanzania principally deal with technology appliances used for the automation of academic processes and other related activities. An account by an actor in the policymaking processes gives much insight into both the goals of the policy and the hindrances that confront its implementation. The automation of activities such as automatic attendance systems, electronic grade books, and scheduling systems indicates the policy thrust toward promoting a digitally receptive learning culture. The ICT policy, therefore, engages in making follow-ups to ensure the policy is correctly applied. ICT policy, however, does not foster ICT integration that much; it rather arranges some initiatives and observes their complementarity with others. This means the ICT policy does not give any ICT tools to Tanzanian higher education. Therefore, poor infrastructure hinders ICT integration in a particular university is not a concern for the policy.

Lastly, conclusions drawn from this study also reveal unexpected results such as: lecturers and pre-service teachers recognise the potential of ICT, yet rarely integrate it into their teaching practice. This highlights a gap between their attitudes and actual classroom behaviour. Furthermore, the study shows that lecturers do not receive ongoing training or professional development. This suggests that policy implementation remains superficial. Additionally, the existence of policy scarcely influences the integration of ICT in classrooms. This disconnects

between policy and practice exposes systemic weaknesses, such as a lack of accountability or failure to adapt to the specific context.

Therefore, based on the contradictions identified in teaching and learning activity systems, higher education institutions in Tanzania must adopt a more holistic approach to ICT integration, moving beyond simply providing digital tools. Vygotsky states that learning is socially mediated and that effective ICT integration depends on the cultural environment and interactions among learners, tools, and facilitators. Similarly, Engstrom highlights learning as a product of interconnected systems, noting that tensions such as intention versus implementation can foster innovation if properly managed.

These insights align with Mtani's (2022) conclusion that courses should also focus on training instructors to develop high self-efficacy and intrinsic motivation towards ICT use. This effort must be supported by robust infrastructure, especially reliable and sufficient internet access, as Mirata (2022) points out that the lack of technical resources continues to hinder digital transformation in Tanzanian universities. Furthermore, Swai (2022) reports that prospective teachers are dissatisfied with ICT resources, suggesting that students' needs and perceptions should also shape ICT policies. Consequently, professional development should be ongoing, contextually relevant, and collaborative, emphasising peer mentorship and practical application of ICT tools in teaching.

Policies should also be reviewed to ensure they are founded on sound theoretical principles while remaining practically applicable and subject to regular institutional monitoring. In line with CHAT's third generation, contradictions between institutional policy, actual practice, and perceived benefits should be regarded as productive tensions capable of driving systemic learning and sustainable change. Ultimately, adopting an integrated and socially responsive approach to ICT is crucial aimed at promoting an enlightening atmosphere anywhere digital technologies efficiently mediating.

5.3 Recommendations

Given these findings and emerging contradictions within teaching and learning systems, it is recommended that higher education institutions and policymakers do more than just provide ICT tools; they must also address the socio-cultural and institutional factors that influence their use. Specifically, institutions should enhance professional development programmes aligned with Sociocultural Theory principles, promoting collaborative, socially mediated learning environments for lecturers and pre-service teachers. Policies should also ensure that ICT integration is genuine and not merely symbolic, supported by practical infrastructure, ongoing training, and mentorship schemes. In accordance with CHAT's third generation, such tensions and contradictions identified in this study should be viewed as opportunities for systemic transformation through collective learning and coordinated actions across universities, faculties,

and ICT support systems. Based on this, recommendations are made to further support the process of integrating ICT into teaching and learning in higher education in Tanzania.

a. Investment in ICT Infrastructure Development

The study revealed that inadequate ICT infrastructure is one of the barriers to ICT integration in Tanzanian higher education. Therefore, the government and higher education institutions should invest more in ICT infrastructure, including the provision of projectors and smart classrooms, reliable and high-speed internet access throughout the lecture halls, and ensuring stable electricity, especially in rural areas.

b. Capacity Building and Digital Literacy Enhancement

As the pre-service teachers confirm a low level of ICT competence they face as a challenge, especially in ICT utilization, and each university must regularly hold ICT keeping fit workshops for academic staff and students. Intentionally, ICT skills should be a core component of teacher education curricula in such a way that pre-service teachers may be competent in the digital teaching environment.

c. Review and Strengthen ICT Policy Implementation

While a national ICT policy demands the use of digital systems such as online grade books and automated attendance, contextual issues such as rather poor readiness and environmental limitations give rise to gaps in implementation, the policymakers should undertake a national audit of ICT policy to account for implementation irregularities and to formulate implementable guidelines. Furthermore, the policy should be clear accountability that institutions can comply with the ICT Policy while receiving assistance.

d. Strengthening ICT Support during Teaching Practice

In place of pre-service teachers' claim that ICT is not utilized during teaching practice because of school policies, lack of equipment, and electricity challenges, there is a need of improvement. For this reason, the Ministry of Education should provide guidelines for ICT integration in teaching practice and provide minimum ICT resources in schools.

e. Fostering Public-Private Partnerships

Due to resource constraints as reported by both lecturers, pre-service teachers and policymaker, the government should partner with private sectors such as NGOs to get sponsorship. Again, based on its major findings and limitations, this study proposes two recommendations that can be pursued by future studies. According to the importance of ICT in the education system, this study recommends that further studies may focus on: one, to investigate how to improve pre-service teachers' ICT competence and change their attitude towards using ICT. As mentioned in

the analysis and discussion section, this might be regarding such things as developing a model that is able to inform professional development practices, particularly ICT integration in teaching and learning. Also, another study may work on how to improve the infrastructure, such as the availability of ICT devices and internet access in Tanzanian higher institutions.

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APPENDICES

Appendix 1. Research Permit Letter from Policymaker



Kementerian Agama Republik Indonesia
Universitas Islam Internasional Indonesia
Jalan Raya Bogor KM. 33.5
Cisalak, Sukmajaya, Depok, Jawa Barat 1641E
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Ref. No : 118/Dek.FIP/UIII/UM.02/3/2025
Attachment :-
Subject : Request for Research Permit

Depok, March 27, 2025

Dear Sir/Madam,

Assalamu'alaikum Wr. Wb.

We hereby certify the following student:

Name : Siraju Husseni Barantota
Student ID Number : 04212320012
Faculty : Faculty of Education
Study Program : MA in Education

is conducting research for his thesis with the following details:

Thesis Title : Exploring Integration of Information and Communication Technology in Teaching and Learning in Tanzanian Higher Education
Research Location : Morogoro, Tanzania
Research Duration : ± 1 month

We respectfully request your assistance in granting research permission to the student. Thank you for your kind attention and cooperation.

Wassalamu'alaikum Wr. Wb.,

Kind Regards,
Dean of the Faculty of Education



Prof. Nina Nurmila, PhD

Received and accepted on Thursday
27th March 2025. I will be ready to conduct
interviews on Saturday 29th March 2025.
ABDULLAH ISSA AK SAKIB
Municipal School Quality Assurance Officer
SCHOOL QUALITY ASSURANCE SPECIALIST
Box 325 - MOROGORO
MOBILE: +255782228871

Appendix 2. Instruments (Interview Schedule for Lecturers, Pre-service Teachers and Policymakers).

RQ1: How do lecturers and pre-service teachers perceive the integration of information and communication technology in the teaching and learning process?

A. Questions for lecturers

1. What is your opinion towards ICT integration in teaching and learning in your university? Does ICT contribute to your teaching effectively?
2. For what educational purposes and how frequently do you use ICT?
3. So, what does motivate you to use ICT in teaching and learning?
4. For how long have you been employing information and communication technology within the context of teaching? What are your experiences when using information and communication technology to pre-services teacher?
5. What pedagogical practices do you use to teach learners reflecting to information and communication technology integration in classrooms?
6. Is ICT appropriate to your teaching and learning activities?
7. Have you ever had Formal ICT training? If so, can you describe what type of training you received?
8. Do you have a guideline or policy for teachers on the use of ICT in your university?
9. Does the Tanzanian educational policy support ICT integration in Tanzanian higher education?

B. Questions for pre-service teachers

1. Do you integrate ICT in your classroom activities during your teaching practice?
2. Does information and communication technology contribute to your learning purposes?
3. Do you have adequate knowledge to use ICT equipment effectively in your learning process?
4. Does your school environment support the use of ICT in your learning process?
5. Do you have free internet in your surrounding university? How do you rate information and communication technology facilities provided to you for enhancement of learning purposes?
6. What is your opinion towards the use of ICT in teaching and learning?

RQ2: “What are the challenges faced by lecturers and pre-service teachers in integrating information and communication technology in teaching and learning?”

A. Questions for lecturers

1. What conditions lead you to not use ICT in teaching and learning?
2. What sorts of challenges do you face when integrating ICT in classrooms activities?
3. What kinds of challenges do your learners face?
4. How is Information and communication technology affected by school infrastructure?

B. Questions for pre-service teachers

1. What challenges do you face when using ICT in your learning process?
2. How is Information and communication technology affected by school infrastructure?
3. What conditions lead you to not use ICT during teaching practice?

RQ3. To what extent does policy support ICT integration in teaching and learning in Tanzanian higher education?

1. How do you understand the ICT policy in Tanzanian higher education?
2. How is ICT policy being implemented in Tanzanian higher education?
3. Are you involved in the process of drafting the policy? If yes, how?
4. What is your role in the higher education ICT policy implementation process?
5. Do you think, to what extent, the Tanzanian higher education ICT policy fit with the current generation of university students?
6. To what extent does Tanzanian ICT policy contribute to tangible results in higher education?
7. What factors do you consider as obstacles for ICT policy implementation in Tanzanian higher education? How do you overcome these challenges?
8. Is there anything else you would like to add?

A. Appendix III: Source of the instrument items. Tefera, B. F. (2022, pg 174).

Questions followed by a number of probing questions based on participants' points/reflections.

1. How frequent and for what educational purposes do you use ICT?
2. What drives/motivates you to use ICT in teaching and learning?
3. How is ICT relevant to your activities (teaching and learning)?
4. What factors determine you (not) to use ICT in teaching and learning and how do these determinants affect your use of ICT?
5. What are the enablers and barriers to instructors' educational use of ICT?
6. Any points you want to add in relation to your use of ICT in teaching and learning?

B. Shuro, V. (2020, 98-9)

The following questions will be asked during in-depth interviews:

- 1.1 How do teachers use information and communication technology to teach learners experiencing barriers to learning?

1.1.1 What type of barriers to learning do you think learners experience?

1.1.2 How do you use Information and communication technology in your teaching and learning activities?

1.1.3 What are your experiences when using information and communication technology to teach learners experiencing barriers to learning?

1.1.4 What challenges do you face when teaching using information and communication technology?

1.2 The role of Information and communication in teaching of learners experiencing barriers to learning.

1.2.1 What are barriers to learning and in what way can information and communication technology eliminate barriers to learning?

1.2.2 Do learners experiencing barriers to learning have skills to make effective use of information and communication technology?

1.2.3 Is there any guideline or policy for teachers to use ICT in the school?

1.2.4 Does ICT make your teaching more effective?

1.2.5 What do you suggest can be done in this school so that teachers can effectively

use information and communication technology in delivering their lessons when teaching learners experiencing barriers to learning?

1.3 How can the use of information and communication technology be used to enhance teaching and learning?

1.3.1 How do you rate information and communication technology facilities provided to you for enhancement of teaching and learning purposes?

1.3.2 Do you have sufficient knowledge to use ICT equipment effectively and efficiently when teaching learners experiencing barriers to learning?

1.3.3 How has your use of ICT in teaching learners experiencing barriers to learning facilitated their ability in knowledge acquisition, use and understanding of your lessons?

1.3.4 Have you undergone any professional ICT training before? If yes, can you describe the kind of training?

C. Mofarreh (2016: 243)

Sample interview questions for: Principal

1- What is your definition of educational policy?

2- How does your school implement a policy provided by the Ministry?

3- What is your role in the implementation process?

4- Is the use of technology incorporated into all of your school policies for each subject area?

5- Do you provide teachers for training about implementation of ICT policy? How are they selected? Do you have plans for training and selecting your teachers?

6- How does a school manager implement the ICT policy?

7- Are you satisfied with ICT policy in secondary schools? If yes how? If no why?

8- Do you think your teachers are satisfied with implementation of the ICT policy?

And how would teacher satisfaction be measured? Do you ask for teacher?

feedback? How?

9- To what extent do you think ICT policy in secondary schools is well designed and does it provide tangible results?

10- In your opinion, what factors facilitate the implementation of ICT policy in secondary schools?

11- In your opinion, what factors that hinder the implementation of ICT policy in secondary schools? What do you suggest to overcome these obstacles?

12- Do cultural factors hinder the implementation of ICT policy in secondary schools? If so, can you identify some of these cultural factors? To what extent does it support or hinder the implementation of ICT policy in secondary schools?

13- What are the major requirements for the successful implementation of ICT policy in secondary schools?

14- Would you like to make any other comments?

Appendix 3. An Overview of Thematic Analysis

The findings from the data collection process, conducted through an online interview, were organised here under the following thematic analysis, based on the research questions:

Research questions	Themes	Determinants
RQN 1. How do lecturers and pre-service teachers perceive the integration of ICT in the teaching and learning process?	❖ Lecturers' perceived benefit towards ICT integration in teaching and learning ❖ Advantages of ICT ❖ ICT integration in teaching and learning in Tanzanian higher education	
	❖ Pre-service teachers' perceived benefits towards ICT integration ❖ Environmental support	
RQN 2. What are the challenges faced by lecturers and pre-service teachers in integrating ICT in teaching and learning?	❖ Challenges faced by lecturers	✓ An inadequate of ICT devices ✓ Challenges related to internet access ✓ A low level of ICT competence among pre-service teachers.
	❖ Challenges faced by pre-service teachers	✓ Challenges related to internet access ✓ A low level of ICT competence ✓ An inadequate number of ICT devices
RQN 3. To what extent does the role of policy support ICT integration in higher education?	❖ Understanding of ICT Policy in Tanzanian higher education.	
	❖ Policy implementation in Tanzanian higher education	
	❖ Challenges faced by policymakers in Policy implementation	