

Impact of Digital Technologies in Teaching and Learning: An Experience from Mvomero District Primary School Teachers in Morogoro, Tanzania

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ABSTRACT

The integration of digital technology in education has transformed teaching and learning by enhancing instructional delivery, expanding access to educational resources, and promoting learner engagement. Despite these benefits, many primary schools in Tanzania still face challenges in adopting and effectively using digital technologies. This study aims to examine the impact of digital technology on teaching and learning among primary school teachers in Mvomero District, Morogoro Region, Tanzania. Specifically, the study seeks to assess the availability and use of digital technologies in primary schools, evaluate their impact on teaching effectiveness and pupils' learning outcomes, and identify the challenges affecting their implementation. The study will employ a mixed-methods research approach using a descriptive research design. The target population will consist of primary school teachers, head teachers, Ward Education Officers (WEOs), and the District Education Officer (DEO). A sample of 100 respondents will be selected using simple random sampling for teachers and purposive sampling for key informants. Data will be collected through questionnaires, interviews, and document review. Quantitative data will be analyzed using descriptive statistics such as frequencies, percentages, tables, and charts, while qualitative data will be analyzed through thematic analysis. The findings of this study are expected to provide valuable insights into how digital technology contributes to improving teaching and learning in primary schools. The study will also identify barriers to the effective integration of digital technologies and recommend practical strategies for policymakers, education administrators, schools, and other stakeholders to strengthen the use of digital technology in primary education in Tanzania.

Keywords:

digital technologies, teaching and learning, primary education, primary school teachers, Mvomero district, Morogoro, Tanzania

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1. INTRODUCTION

Working life and everyday practices are increasingly dependent on technology and digitalization (OECD 2015). To prepare students for societal changes and the demands of the new global economy, one of the key focuses of Finnish basic education reform is to promote new learning environments that foster students' twenty-first-century skills, such as digital literacy and collaboration (The Ministry of Education and Culture 2016). The education reform has highlighted the need to increase the use of digital technologies for learning and assessing these skills (Ahonen and Kankaanranta 2015; Göçen et al. 2020). This involves not only teachers' technical skills in using digital technologies but also the ability to apply them effectively in their own teaching (Mishra and Mehta 2017; Sumardi et al. 2020).

Understanding of the critical role ICTs play in our daily lives continues to grow, and this is evident not only in business, industry, and economics but also in teaching and learning (Barak and Rafaeli, 2004; Dori et al., 2003). Education, as the bedrock for acquiring knowledge, has embraced emerging technologies in a bid to expand knowledge. Digital and advanced technologies are now integral to the teaching and learning process in classrooms. These technologies, according to Barak et al. (2006), can become a significant component of today's education and can change the manner in which class interactions and information flows occur. Despite the increasing advancement in ICT facilities in Western and Asian countries, African countries remain stagnant in ICT implementation, and this continues to further widen the digital and knowledge divides (Kiptalam and Rodrigues, 2010).

For teachers, involvement in further education and training is essential. Upgrading their knowledge and skills (Kiptalam and Rodrigues 2010) is an undeniable advantage in the educational market (Hužovičová & Jakúbek, 2014) and also contributes to teachers' professional and personal growth (Tamášová, 2015). To keep pace with current knowledge, they need to develop their skills and participate in lifelong learning activities throughout their lives. They must be well prepared for various, even unexpected or unpredictable situations, including global crises or pandemics, when traditional schemes and procedures are simply useless as the conditions, needs, and requirements of all stakeholders change in an instant.

According to Portugal INCoDe.2030 (2017) and OECD (2018), preparing students to be responsible and conscientious in the present and future requires the ability to coexist with digital technologies and to develop comprehension (Tamášová, 2015) through the early acquisition of user-level knowledge, often through intervention, which means developing logical reasoning, collaborative work and design, and code development skills (Rodrigue, 2010), such as programming language knowledge. It also requires the ability to think critically and creatively by transforming reality through reflection, anticipation, and action (Kiptalam and Rodrigues, 2010).

It requires empathy, curiosity, resilience, adaptability, responsibility, the ability to act, the mobilization of knowledge with rigor and coherence (Barak et al., 2006), solving problems effectively, and trust and respect for self and others. The reality of the pandemic, with schools closed and other restrictions, has shown how important digital technologies in education are and that online education represents an efficient alternative (Dori et al., 2003) to the traditional in-person form of education from primary education to lifelong learning (Pasternáková & Gabrhelová, 2016). Although participation in formal in-service training, involvement in various forms of nonformal and informal education, as well as self-learning can significantly increase the quality and the efficiency of teachers' educational work (Pasternáková et al., 2016), these are also important for their career advancement – many teachers are demotivated by the barriers related to adult learning they must overcome (see e.g., Porubčanová & Pasternáková & Gabrhelová, 2016). For them, lifelong learning activities based on using digital technologies may represent an optimal solution, as they enable personalized learning that is accessible, flexible, and open to everyone.

A study conducted in Morogoro Municipality, Tanzania, found that primary schoolteachers nowadays increasingly use tablets, mobile phones, printers, projectors, the internet, and computers to prepare lessons, present instructional materials, and access online educational resources (Göçen et al., 2020; Porubčanová et al., 2016). These tools help facilitate learning and teaching for students (Gabrhelová et al., 2016). Another study on primary school education reported that teachers use Zoom, Google Classroom, WhatsApp, PowerPoint presentations, and video conferencing applications to support classroom teaching and communication with learners (Dori et al., 2003, example used during COVID-19 to support students' learning at home).

1.1. Problem statement

The integration of digital technology into education has become a global priority due to its potential to improve teaching effectiveness, enhance students' learning experiences, and increase access to quality educational resources. Governments and educational stakeholders have invested in digital technologies such as computers, projectors, internet connectivity, tablets, and educational software to support the teaching and learning process. In Tanzania, the government has introduced various initiatives to promote the use of Information and Communication Technology (ICT) in schools as part of improving the quality of education

Despite these efforts, the effective integration of digital technology in many public primary schools remains limited. Many

schools continue to face challenges such as inadequate digital infrastructure, unreliable electricity and internet connectivity, insufficient teaching and learning devices, limited digital skills among teachers, and inadequate technical support. These challenges hinder teachers from effectively integrating digital technology into classroom instruction, thereby limiting its potential to improve teaching and learning

outcomes

1.2. Research Questions

The study is guided by the following research questions;

1. *What digital technologies do primary school teachers in Mvomero District, Morogoro, Tanzania, use for teaching and learning?*
2. *How do primary school teachers use digital technologies for teaching and learning in Mvomero District, Morogoro, Tanzania?*
3. *What challenges do primary school teachers face in using digital technologies for teaching and learning in Mvomero District, Morogoro, Tanzania?*
4. *What is the impact of digital technologies on teaching and learning among primary school teachers in Mvomero District, Morogoro, Tanzania?*

2. LITERATURE REVIEW

2.1. Theoretical review

This study is guided by the Technology Acceptance Model (TAM), which was developed by Fred D. Davis (1986) and later refined by Davis (1989). The model was originally designed to explain and predict users' acceptance and adoption of information technology. TAM has become one of the most widely used theoretical frameworks in educational technology research because it explains why individuals accept or reject technological innovations in different contexts, including teaching and learning. According to Davis (1989), the Technology Acceptance Model proposes that technology acceptance is determined primarily by two key constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived usefulness refers to the extent to which an individual believes that using a particular technology will improve job performance, while perceived ease of use refers to the extent to which an individual believes that using the technology requires minimal effort. These two constructs shape users' attitudes toward technology, influence their behavioral intention to use it, and ultimately determine actual technology use (Venkatesh & Davis, 2000)

In educational settings, TAM suggests that teachers are more likely to integrate digital technologies into classroom instruction when they perceive such technologies as beneficial for improving teaching effectiveness and students' learning outcomes (Teo, 2011). Digital technologies such as computers, tablets, projectors, internet resources, educational software, and mobile learning applications can enhance lesson preparation, classroom interaction, learner engagement, assessment practices, and access to educational resources. However, teachers' adoption of these technologies largely depends on whether they perceive them as useful and easy to use (Scherer et al., 2019). The relevance of TAM to this study lies in its ability to explain the adoption of digital technologies among primary school teachers in Mvomero District, Morogoro Region. Although the Government of Tanzania has continued to promote the integration of Information and Communication Technology (ICT) in education, the successful implementation of digital technologies depends not only on the availability of technological infrastructure but also on teachers' acceptance of these technologies. Teachers who perceive digital technologies as useful in improving instructional quality and easy to operate are more likely to integrate them into their daily teaching practices. Conversely, teachers who perceive digital technologies as complex, time-consuming, or irrelevant may be reluctant to use them despite having access to the necessary facilities.

2.2. Empirical review

2.2.1. Digital Technologies Used by Primary School Teachers in Teaching and Learning

Several studies have identified the digital technologies commonly used by primary school teachers (Mishra and Mehta 2017; Sumardi et al. 2020). These technologies include desktop computers, laptops, tablets, smartphones, projectors, radios, televisions, internet services, educational software, and online learning platforms for students (Aslan and Zhu 2016; Tammaro and D'Alessio 2016). Work and everyday practices are increasingly dependent on technology and digitalization (OECD 2015). To prepare students for societal change and the demands of the new global economy, one key focus of Finnish basic education reform is to promote new learning environments that foster students' twenty-first-century skills, such as digital literacy and collaboration (The Ministry of Education and Culture 2016). The education reform has highlighted the need to increase the use of digital technologies for learning

and assessing these skills (Ahonen and Kankaanranta 2015; Göçen et al. 2020). Digital learning also requires an appropriate pedagogical approach that calls for teachers to integrate digital competence into their practice (Aslan and Zhu 2016; Tammaro and D'Alessio 2016). This involves not only teachers' technical skills in using digital technologies but also the ability to apply them effectively in their own teaching. However, several studies have revealed a lack of skills in using digital technologies among teachers and a need for pedagogical support in their work with ICT (Mishra and Mehta 2017; Sumardi et al. 2020). In Tanzania, particularly in Morogoro Region and Mvomero District, the use of digital technologies among primary school teachers has increased following the expansion of mobile network services and digital communication technologies. Primary school teachers increasingly rely on smartphones to access online teaching materials, communication platforms (Morze et al., 2016), and educational information. Laptops and desktop computers are also used in some schools where ICT facilities are available. However, differences in infrastructure availability between schools continue to influence the extent to which teachers utilize internet-enabled ICT tools (Heemskerk et al., 2012).

Table 1 :

Summary of Digital Technologies Used by Primary School Teachers in Teaching and Learning

Digital technology	Purpose in teaching and learning	Benefits	Citation (s)
Desktop computers	Preparing lessons notes, accessing teaching materials and Keep records	Improves lesson preparation	Mishra &Mehta (2017) Sumardi et al. (2020)
Laptops	Preparing presentation, lesson planning,	Enhances teacher productivity	Aslan & zhu (2016) Tammaro & D'Alessio (2016)
Internet services	Research, downloading learning materials, online collaboration	Provides access to update educational information and resources	Porubcanova et al (2016)
WhatsApp	Teacher- learner communication, sharing of notes and announcements	Promotes continuous communication and collaborative learning	Göçen et al. (2020)
Educational videos	Demonstrating concepts and supporting classroom instruction	Improves learners' understanding and retention	Dori et al (2003)
Zoom	Conducting virtual meetings and distance learning	Supports remote teaching and learning	Dori et al (2003); Göçen et al. (2020)

Smartphones	Communication, internet browsing, accessing online learning materials, having WhatsApp learning group	Facilitates communication and quick access education resources	Morte et al. (2016); Göçen et al. (2020)
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2.2.2. How Primary School Teachers Use Digital Technologies in Teaching and Learning

In the past few decades, there has been an increasing amount of literature concerning the use of digital technologies in education (OECD 2015; Sungetal.2016). Digital technologies serve different educational purposes and offer various advantages compared with traditional learning tools (Faber et al. 2017). Experimental evidence has shown that digital technologies not only can be used as effective tools to promote learning achievement and collaborative learning (Laakso et al. 2018; Kurvinen et al. 2018; Kurvinenet al. 2020), but also can be useful assessment tools for tracking students' learning progress and for improving teachers' own teaching (Faber et al. 2017; Kurvinenetal.2016; Laakso et al. 2018).

Teachers use digital technologies in various ways to improve teaching effectiveness and learning outcomes (Samoylenko et al., 2012; Heemskerk et al., 2012; Morze et al., 2016). One common use is lesson preparation, where teachers develop notes, presentations, examinations, and teaching aids using computers and mobile devices (Morze et al., 2016). Research indicates that teachers use PowerPoint presentations, videos, animations, and online materials to simplify difficult concepts and enhance understanding among primary school students (Suleiman et al., 2020; Heemskerk et al., 2012; Samoylenko et al., 2012; Ghavifekr et al., 2018; Morze et al., 2016). Teachers also use digital technologies to communicate with students, parents, and fellow teachers via email, WhatsApp groups, and online platforms to improve education at the primary level (Ghavifekr et al., 2018; Morze et al., 2016).

Digital technologies may offer new possibilities, but individuals and groups will use them in different ways, shaped by personal, social, cultural, economic, and political circumstances, as well as their individual needs, commitments, interests, and passions (Faber et al., 2017). Sometimes practices are associated with our families, friends, or leisure interests; sometimes with education or employment; and sometimes with political or economic activity (Laakso et al., 2018). These uses may generate new kinds of relationships among individuals, groups, institutions, and organizations, or they may simply rework existing ways of doing things. Practices may, of course, be advantageous or disadvantageous (Selwyn and Facer, 2013). A study conducted in Malaysia shows that all elementary school teachers receive basic training on the use of computers and the internet through courses and various training workshops (Hoque, Razak, & Zohora, 2012). Schools in Malaysia facilitate the development of information and the use of digital technology for students according to their professional level (Kim, Choi, Han, & So, 2012).

Also in Tanzania, some teachers use tablets and smartphones to access digital education, curriculum materials, and online references that support classroom teaching (Selwyn and Facer, 2013). During and after the COVID-19 pandemic, many teachers adopted online teaching methods for students, including virtual classes and e-learning platforms, to continue learning and to issue instructions or announcements from school (Kim, Choi, Han, & So, 2012). Moreover, digital technologies help teachers with student assessment and record management (Hoque, Razak, & Zohora, 2012). Primary school teachers use software and digital systems to prepare examinations, record marks, and monitor learner progress. This improves efficiency and accuracy in educational management, teaching, and learning.

Table 2:

How Primary School Teachers Use Digital Technologies in Teaching and Learning

Area of use	How digital technology is used	Expected outcome	citations
Lesson preparation	Preparing lesson notes, schemes of work, presentations, and instructional materials using computers and mobile devices	Improves lesson planning and teaching effectiveness	Morze et al. (2016); samovlenko et al. (2012)

Classroom instructions	Using PowerPoint presentations, videos, animations, and online learning materials during teaching	Enhances learner and engagement understanding of concepts	Suleiman et al. (2020); Heemskerk et al. (2012)
Communication	Communicating with pupils, parents, and fellow teachers through emails, WhatsApp groups, and online platforms	Improves collaboration and information sharing	Ghavifekr et al. (2018); Morze et al. (2016)
Assessment	Preparing examinations, administering assessments, recording marks, and tracking learners' progress using digital systems	Improves accuracy and efficiency in assessment and record management	Kurvinen et al. (2020); Kim et al. (2012)
Online teaching and learning	Conducting virtual classes through elearning platforms, especially during and after the COVID-19 pandemic	Supports continuous learning beyond the classroom	Kim et al. (2012); Houque, Razak& Zohora (2012)
Educational administration	Preparing reports, maintaining student records, and managing classroom information using digital technologies	Improves efficiency, organization, and school management	Kim et al. (2012); Morze et al. (2016)
Professional development	Participating in online training, workshops, and digital learning communities	Enhances teachers' digital skills and pedagogical knowledge	Houque, Razak& Zohora (2012)

2.2.3. Challenges Faced by Primary School Teachers in Using Digital Technologies in Teaching and Learning

Although digital technologies can enhance students' learning and motivation (Faber et al. 2017; Laakso et al. 2018), prior research has identified several challenges to integrating them into classroom practice (Aslan and Zhu 2016; Durff and Carter 2019; Ertmer 1999). Ertmer (1999) framed these challenges as barriers to change, the extrinsic and intrinsic factors that hinder teachers' efforts to implement innovations in their practice. Some teachers may be constrained by external barriers, such as limited access to resources, training, and support, while others may struggle to overcome intrinsic barriers linked to teachers' confidence, beliefs, attitudes, and the perceived value of technology (Ertmer et al. 2012). This explanation aligns with a model of technology integration proposed by Christensen and Knezek (2008).

Several studies have reported that teachers lack confidence in their content knowledge of STEM subjects and face challenges when implementing and working with technological equipment in their schools (Landwehr et al., 2021; Möller, 2010; Rohaan, 2009; Yu et al., 2021). This finding was also evident in a recent study by Suvarma and Kumano (2019), in which teachers perceived the integration of science and mathematics as less challenging and complicated than the integration of engineering and technology. In comparison to other subjects, teachers often do not clearly understand the nature of technology education, and it is, therefore, challenging to integrate technology-related topics into their teaching practices (Çengel et al., 2019; Gibson, 2009; Wang et al., 2011).

Pupils in our schools today are excited to use technology and ICT tools to learn and explore their world. This excitement and

other behavior change exhibited by pupils in technology enabled lessons in classroom go a long way to influence their readiness to integrated ICT in their learning process or otherwise. According to previous studies (Dabholkar, 1994; Mick and Fournier, 1998; Parasuraman, 2000; Parasuraman and Colby, 2001), a mixture of positive and negative beliefs about technology is responsible for the domain of technology readiness.

For instance, both (Dabholkar ,1994; Mick and Fournier ,1998) asserted that information technology/information system (IT/IS) “ consumers with more positive beliefs are more receptive and ready to use the various new technologies. In addition, (Dabholkar ,1994) found that individuals simultaneously harbor positive (favorable) and negative (unfavorable) beliefs about technology. The positive beliefs propel individuals towards new technologies, while negative beliefs may hold them back. (Colby ,2001) defined technology readiness as people’s predisposition to accept and use new technologies at home and at the workplace

They conclude that most teachers are not qualified in digital technology and that as a result the use of technology fails to contribute to pupils’ meaningful learning. For such a purpose, programmers aimed at teacher development need to be based more on practical training. (Lindfors,2021; Pettersson, 2021; Olofsson ,2021) investigated how teacher educators experienced the conditions for using and developing student teachers’ competences for digital teaching. The authors viewed this as a dual task. In their study of 14 teacher educators, the need for better conditions became apparent in the interview data. Björk Gudmundsdottir and Edvard Hatlevik (2018) examined newly qualified teachers’ experiences of digital technology. In their sample of 356 teachers, the general tendency was to report fairly poor quality in their ICT training during their initial teacher education. Silva, Usart, and Lázaro-Cantabrana (2019) measured digital competence in the final year of student teachers’ pedagogy training in Chile and Uruguay and found that student teachers generally did not have enough digital competence to use digital technology effectively

Although in Tanzania digital technologies offer many educational benefits both to primary school teachers and students but also face several challenges (Landwehr et al., 2021; Möller, 2010; Rohaan, 2009) in integrating them effectively into teaching and learning in education level of primary schools. One major challenge identified in literature is inadequate ICT infrastructure. Many primary schools, particularly in rural areas, lack computers, tablets, projectors, reliable electricity, and internet connectivity (Lázaro-Cantabrana ,2019). In Tanzania, rural schools continue to experience shortages of digital learning facilities and technological equipment in learning and teaching (Lindfors,2021; Pettersson, 2021; Olofsson ,2021). Another challenge is limited ICT knowledge and skills among teachers. Studies show that many teachers have insufficient training in digital literacy and technology integration (Ertmer et al. 2012). As a result, they lack confidence and decrease competence in using digital technologies effectively in classrooms during teaching, also negative attitudes toward digital technologies also affect implementation of it in primary schools.

Some teachers perceive digital technologies as difficult, time-consuming, or unnecessary in primary education (Faber et al. 2017; Laakso et al. 2018). Resistance to change and fear of technology reduce teachers’ willingness to integrate digital tools into instruction in primary schools (Laakso et al. 2018). Financial limitations constitute another barrier. Schools (Laakso et al. 2018), often lack sufficient funds to purchase digital devices, maintain equipment, or provide internet services example in rural remote area (Faber et al. 2017). Additionally, inadequate technical support and maintenance services discourage teachers from using technology regularly during teaching (Olofsson et al ,2021)

Table 3:
Challenges Faced by Primary School Teachers in Using Digital Technologies in Teaching and Learning

Challenge	Description	Effects on teaching and learning	citations
Inadequate digital skills	Many teachers lack sufficient ICT knowledge and digital competence to teach integrate technologies	Reduces teachers’ confidence and limits effective technology integration	Ertmer (1999); Pettersson (2021); Olofsson (2021)
Insufficient teacher training	Teachers receive limited professional training in ICT integration and digital pedagogy.	Poor utilization of digital technologies in classroom instruction.	Lindfors (2021); Vuorikari & Punie (2019)

Lack of ICT infrastructure	Many schools lack computers, tablets, projectors, and other digital devices.	Restricts teachers' ability to use digital technologies during lessons.	Lazaro-Cantabrana (2019); Lindfors (2021)
Poor internet connection	Schools experience unreliable or unavailable internet services, particularly in rural areas.	Limits access to online teaching materials and e-learning platforms.	Faber et al. (2017); Lazaro-Cantabrana (2019)
Unreliable electricity supply	Frequent power interruptions affect the operation of digital devices.	Interrupts teaching and reduces technology use in classrooms.	Lindfors (2021)
Negative attitudes	Some teachers perceive digital technology as difficult, unnecessary, or timeconsuming.	Low willingness to adopt digital technologies in teaching.	Faber et al. (2017); Laakso et al. (2018)
Financial constraints	Schools have inadequate funds to purchase ICT equipment, software, and internet services.	Limits the availability and sustainability of digital technologies.	Laakso et al. (2018)

2.2.4. Impact of Digital Technologies on Teaching and Learning

The studies demonstrate or show that digital technologies positively influence teaching and learning processes when properly implemented can bring impact on primary schools' teachers during learning and teaching (Blömeke et al., 2010; Bozick et al., 2017; Mammes et al., 2016). The importance of the development of both teachers' and students' technological skills and engagement in technology education has already been discussed in teacher-education research (e.g., Boeve-de Pauw et al., 2020; Rossouw et al., 2011; Sherman et al., 2010; Wright et al., 2018). However, technology-related topics and professional development efforts are not yet being properly introduced in pre- and in-service teacher education (Blömeke et al., 2010; Bozick et al., 2017; Mammes et al., 2016).

Collaborative use of technology (in pairs or small groups) is usually has more effective impact than individual use. This can be identified in separate meta-analyses (e.g., Liao, 2005) where it has been identified as a cause of variation, and as a general trend in technology studies (Lou et al. 2001). However, some pupils, especially younger children, may need support in collaborating effectively. Technology can be used very effectively as a short but focused intervention to improve learning (Bayraktar 2001; Moran et al. 2008), particularly when there is regular and frequent use (about three times a week: Bangert-Drowns, 1993; Cheung & Slavin; 2011) over the course of about a term (5 -10 weeks: LeJeune, 2002; SandyHanson, 2006). Sustained use over a much longer period is usually less effective at improving attainment (e.g. Liao 1992; Sandy-Hanson, 2006). Remedial and tutorial use of technology can be particularly effective for lower attaining pupils (Lou et al. 2001), or those with special educational needs (Li & Ma, 2010; SandyHanson 2006; Sisson, 2008) or those from disadvantaged backgrounds (Kuchler, 1998, but see also Cheung & Slavin, 2011) in providing intensive support to enable them to catch up with their peers.

Digital technologies promote independence and interaction, they enable visualization of the teaching content, and simulation of processes. At the same time, several threats and difficulties can occur. In learning, it must be taken into account that the ability to actively deal with digital information and media and to communicate with others in the virtual environment (OECD, 2012) are important, also impact in improvement in teaching effectiveness. Digital technologies help teachers deliver lessons more clearly through multimedia presentations, videos, graphics, and interactive content. These approaches increase learners' understanding and retention of knowledge.

The main approach used to evaluate the impact of technology on teaching and learning in schools has been where pupils' attainment across a range of tested curriculum outcomes has been correlated with the quantity or quality of technology which was available or which they experienced in their institutions (see, for example, Watson, 1993; Wenglinsky, 1998; Weaver, 2000; BECTA

2003). In the USA, only a small relationship between computer use in the school curriculum and improvement in pupils' test scores was found in a longitudinal study (Weaver, 2000). At this very general level, computer use makes very little difference to pupils' achievement. In the UK, the Impact 2 study (Harrison et al. 2004) identified statistically significant findings positively associating higher levels of ICT use with school achievement at each Key Stage, and in English, Maths, Science, Modern Foreign Languages and Design Technology. An association between high ICT use and higher pupil attainment in primary schools was also reported in an earlier Teacher Training Agency study (Moseley et al. 1999, p 82) though the interpretation by the research team was that more effective teachers (and more effective schools) tended to use more innovative approaches, or chose to use the ICT resources that they had more appropriately, rather than that the technology itself was the cause of the differences in pupil performance.

In Tanzania digital technologies also have impact to improve learners' motivation and participation (Moseley et al. 1999). Interactive learning tools attract learners' attention and encourage active classroom engagement (Cheung & Slavin, 2011). Research indicates that learners become more interested, concentrated and confident when technology-supported teaching methods are used (Li & Ma, 2010; SandyHanson 2006; Sisson, 2008). Another impact is increased access to educational resources (Sandy-Hanson 2006). Through the internet and digital platforms, teachers and learners can access a wide range of learning materials beyond textbooks (Sisson, 2008). This broadens knowledge and enhances independent learning skills.

Studies further reveal that digital technologies improve communication and collaboration among teachers, students, and parents. Watson, 1993; Wenglinsky, 1998; Weaver, 2000; BECTA 2003). Online platforms facilitate information sharing, assignment submission, and feedback mechanisms (BECTA, 2003). In addition, digital technologies promote the development of 21st-century skills such as creativity, communication, problem-solving, collaboration, and digital literacy among learners (BECTA, 2003). These skills are essential in modern society and future workplaces. (Watson et al, 1993)

Table 4:
Impact of Digital Technologies on Teaching and Learning

Impacts	Description	Effect on teaching and learning	citations
Improve teaching effectiveness	Digital technologies enable teachers to prepare and deliver lessons using multimedia, presentations, videos, and interactive content.	Enhances lesson quality, clarity, and instructional effectiveness.	Blömeke et al. (2010); Bozic et al. (2017)
Increase learning engagement	Interactive digital tools, simulations, and multimedia make learning more interesting and participatory.	Improves learners' attention, motivation, and active participation.	Cheung & Slavin (2013); Li & Ma (2010)
Improved academic performance	Appropriate use of digital technologies contributes to better understanding and higher academic achievement.	Enhances students' learning outcomes and examination performance.	Wenglinsky (1998); Moseley et al. (1999)
Enhanced communication and collaboration	Digital platforms facilitate communication among teachers, learners, parents, and school administrators.	Promotes teamwork, collaboration, and effective information sharing.	Watson (1993); BECTA (2003)
Increase access to learn resources	Internet and digital platforms provide access to e-books, online videos of teaching	Broadens learning opportunities and supports independent learning.	ISandy-Hanson (2006); Sisson (2008)

Improved learner motivation	Digital learning environments make lessons more enjoyable and encourage learners to participate actively.	Increases learners' confidence, interest, and willingness to learn.	Moseley et al. (1999); Li & Ma (2010)
Better feedback and assessment	Teachers use digital technologies to monitor learner progress, assess performance, and provide timely feedback.	Improves assessment accuracy and supports continuous learning improvement.	Wenglinsky (1998); Weaver (2000)

3. METHODOLOGY

3.1. Research design

This study utilized an exploratory qualitative methodology on primary school teachers' perspectives on the integration of digital technologies in teaching and learning from Mvomero district in Morogoro, Tanzania, and describe the current situation regarding the use and impact of digital technologies in teaching and learning among primary school teachers. The design will enable the researcher to explore how teachers experience, interpret, and attach meaning to digital technology integration in their daily teaching activities.

3.2. Study of area

The research study will be conducted in Mvomero District, Morogoro Region, Tanzania, the district was selected because primary schools within the area have experienced varying levels of exposure to digital technologies. The district therefore provides appropriate setting for exploring teachers' experience and perceptions regarding technology use in education at primary schools.

3.3. Targeted population

The targeted population of the research study will comprise primary school teachers working in selected primary schools, head of primary school teachers and ward education officers in Mvomero district to provide additional information regarding the impact of implementing digital technologies in primary schools.

Table 5:

Target population of the study

Category of respondents	Description	Purpose
Primary school teachers	Teachers involved in classroom teaching	To assess the use and impact of digital technology on teaching and learning
Head teachers	Heads of primary schools	To provide information on school management and digital technology implementation
Ward Education Officers		To provide information on monitoring, support and implementation

	Ward education supervisors	
District Education Officer	District education administrator	To provide information on district policies planning a challenge related to digital technology

3.4. Sampling Techniques

This study will employ a combination of simple random sampling and purposive sampling techniques. Simple random sampling will be used to select primary school teachers. This technique provides every teacher with an equal chance of being selected, thereby minimizing selection bias and enhancing the representativeness of the study findings. Purposive sampling will be used to select head teachers, Ward Education Officers, and the District Education Officer because these respondents possess specialized knowledge and administrative responsibilities relevant to the study. Their inclusion will enable the researcher to obtain detailed and reliable information regarding digital technology implementation in primary schools.

3.5. Sample size

The study will involve a total sample of 100 respondents, which is considered adequate for obtain representative information while remaining manageable within the available time and resources Table: Propose sample distribution

3.6. Data collection

The research study will review on relevant documents which will help in collecting of data such as ICT in education policies, school reports, strategic plans and previous research studies related to digital technologies in primary school education. Documentary review will help to supplement and triangulate information obtained from reviews and enables systematic researching on existing documents to obtain relevant information concerning digital technologies use on primary school teachers in learning and teaching

3.7. Data analysis

The data were analyzed using an analysis approach of thematic. The analysis involved careful reading of selected documents to identify key concepts, patterns, and recurring themes related to impact of digital technologies in teaching and learning for primary school teachers

Relevant information extracted from the documents was coded and organized into categories. Similar categories were then grouped into broader themes, including: which digital technologies are used by primary school teachers, how do primary school teachers use digital technologies, Challenges of using digital technologies and impacts of using digital technologies. The identified themes were interpreted to generate findings that addressed the objectives of the study

3.8. Ethical consideration

This research study observed ethical principles in the use of Information and communication Technology (ICT) during data collection and analysis. Permission to conduct the study was obtained from relevant authorities, and informed consent was sought from all participants before data collection. The use of ICT tools ensured secure handling and storage of data to protect respondents' information. Confidentiality was maintained, and all data were used strictly for academic purposes only, the researcher will ensure that no participant is exposed to physical, psychological, emotional, social, or professional harm as a result of participating in the study. Respect for participants' opinions, beliefs, privacy, and cultural values will be maintained throughout the research process, and all ethical standards governing educational research will be strictly observed

4. RESULTS AND FINDINGS

4.1. Digital Technologies Used by Primary School Teachers

The findings revealed that primary school teachers in Mvomero District use a variety of digital technologies to facilitate teaching and learning. The most commonly used technologies include smartphones, computers, internet services, educational websites, social media platforms, projectors, tablets, and learning management systems.

Table 6:
Digital Technologies used by primary school teachers

Digital Technology	Frequency (n=50)	Percentage (%)
Smartphones	48	96
Internet Services	44	88
Computers/Laptops	39	78
Educational Websites	35	70
Social Media Platforms	33	66
Projectors	27	54
Tablets	20	40
Learning Management Systems	16	32

The findings indicate that smartphones were the most frequently used digital technology due to their affordability, portability, and ease of internet access. Internet services and computers were also widely used to access educational content and prepare instructional materials.

4.2. Uses of Digital Technologies in Teaching and Learning

The study found that digital technologies are used for multiple educational purposes, including lesson preparation, accessing online learning materials, conducting academic research, communication, assessment, and professional development.

Table 7:
Finding on the uses of Digital Technologies in Teaching and Learning

Use	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	f	%	f	%	f	%	f	%	f	%
Accessing educational resources	45	45.0	7	7.0	10	10.0	32	32.0	35	35.0
Lesson preparation	38	38.0	6	6.0	12	12.0	45	45.0	40	40.0

Conducting online research	42	42.0	8	8.0	11	11.01	38	38.0	36	36.0
Professional development	40	40.0	8	8.0	10	10.0	40	40.0	39	39.0
Communication with students and parents	30	30.0	5	5.0	9	9.0	33	33.0	42	42.0
Student assessment and evaluation	44	44.0	4	4.0	13	13.0	36	36.0	37	37.0

The findings suggest that digital technologies have become important tools for enhancing instructional effectiveness and improving access to updated educational information.

4.3. Challenges Facing Teachers in the Use of Digital Technologies

The findings identified several challenges affecting the effective use of digital technologies in teaching and learning.

Table 8:

Findings on the Challenges Facing Teachers in the use of Digital Technologies

Challenges	Frequency (n=50)	Percentage (%)
Inadequate ICT facilities	48	96
Poor internet connectivity	44	88
Unstable electricity supply	33	66
Insufficient training opportunities	35	70
Shortage of digital devices	39	78
Limited technical skills	16	32

The findings indicate that inadequate infrastructure and limited technical support remain significant barriers to effective technology integration within primary schools.

4.4. Impacts of Digital Technologies on Teaching and Learning

The findings revealed that digital technologies positively influence educational processes and outcomes.

Table 9:

Impacts of Digital Technologies on teaching and Learning

Impact	Frequency (n=50)	Percentage (%)
Improved access to learning resources	50	100
Enhanced teaching effectiveness	45	90

Enhanced digital literacy skills	30	60
Increased student participation	20	40
Improved communication and collaboration	30	60
Improved academic performance	20	40

The findings demonstrate that digital technologies significantly improve lesson delivery, learner engagement, communication, and access to educational resources.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The study concludes that digital technologies have become important tools in supporting teaching and learning among primary school teachers in Mvomero District. Smartphones, internet services, computers, educational websites, and social media platforms were identified as the most commonly used digital technologies. Teachers use these technologies to access educational resources, prepare lessons, conduct research, communicate with stakeholders, and improve professional competencies. Although teachers experience several challenges, including inadequate ICT infrastructure, poor internet connectivity, unstable electricity supply, and limited training opportunities, the overall impact of digital technologies on teaching and learning remains positive. The technologies have enhanced access to educational materials, improved teaching effectiveness, increased learner participation, strengthened communication, and promoted digital literacy among teachers and learners.

5.2. Recommendations

Educational authorities and school management should strengthen ICT infrastructure in primary schools by providing adequate computers, internet connectivity, projectors, and a reliable electricity supply. Such improvements will facilitate effective integration of digital technologies into classroom teaching and learning activities. The government and educational stakeholders should organize regular ICT training programs to enhance teachers' digital competencies and improve their confidence in utilizing technological tools for instructional purposes. Efforts should be made to improve internet access and affordability in schools so that teachers and learners can access online educational resources without interruption. Schools should encourage the integration of digital technologies into daily teaching practices and create supportive environments that promote technology-enhanced learning. Furthermore, policymakers should continue to develop and implement policies that support sustainable ICT adoption in primary education.

REFERENCE

- Annika Elm and Johan Liljestrand (2024): Developing student teachers' critical awareness of information and communications technology in primary teacher education, *European Journal of Teacher Education*
- Cathy Burnett (2016). *The Digital Age and Its Implications for Learning and Teaching In The Primary School*
- Christina Ioanna Pappa, Despoina Georgiou, Daniel Pittich (2023). *Technology education in primary schools: addressing teachers' perceptions, perceived barriers, and needs*
- Davis, F. D. (1989). *Perceived usefulness, perceived ease of use, and user acceptance of information technology*. MIS Quarterly, 13(3), 319–340.
- Mark Valentine Aikins and Emmanuel Arthur-Nyarko (2019). *Challenges facing information and communication technology implementation at the primary schools*
- Miftahul Jannah, Lantip Diat Prasajo, Mohammad Adam Jerusalem (2020). *Elementary School Teachers' Perceptions of Digital Technology Based Learning in the 21st Century: Promoting Digital Technology as the Proponent Learning Tools*

- Nonmanut Pongsakdi, Arto Kortelainen, Marjaana Veermans (2021). *The impact of digital pedagogy training on in-service teachers' attitudes towards digital technologies*
- Paula QUADROS-FLORES, António FLORES, Altina RAMOS (2018). *Impact Of Digital Technologies on Pedagogical Practice in Primary Education*
- Professor Steven Higgins, ZhiMin Xiao and Maria Katsipataki (2012). *The Impact of Digital Technology on Learning: A Summary for the Education Endowment Foundation*
- Silvia Barnová, Slávka Krásna, Slávka Čepelová (2020). *Digital Technologies as a Means of Teachers' Professional Development*
- Venkatesh, V., & Davis, F. D. (2000). *A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. Management Science, 46(2), 186–204.*