



Investigating Tanzanian secondary school teachers' attitudes and competencies in the use of tablets as a pedagogical tool in teaching and learning

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ABSTRACT

This paper investigates teachers' attitudes and competencies in Tanzanian secondary schools on the use of tablets as a pedagogical tool in teaching and learning. Over the past years, Tanzania has distributed more than 290000 tablets in primary and secondary schools. However, these tablets are still underused, requiring a study to reveal teachers' attitudes and competencies on using tablets. The study was guided by the Constructivist Learning Theory. The study adopted a quantitative research design approach. The target population was 254 secondary schools (151 public and 103 private). Through simple random sampling, a population of 758 secondary school teachers (348 female and 410 male) was selected. Data were collected through questionnaires and interviews, and the researcher observed what was happening in schools. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). Firstly, the study revealed that teachers own various ICT tools, including tablets, smartphones, laptops, and desktop computers. Secondly, the study revealed that teachers are highly competent in using tablets for teaching and learning, with an overall mean of 4.09 and an SD of 1.281. Thirdly, the study reported that most teachers have a positive attitude towards the use of tablets in teaching and learning, with an overall mean of 4.66 and SD 0.87, signifying that most teachers would like to use tablets (mean 4.69, SD 0.79). Teachers perceive ease of use of tables (Mean 4.27, SD 1.26). Most teachers perceive tablets as highly useful for teaching and learning (overall mean: 4.34, SD: 1.17). While some are excited about the benefits tablets can bring to teaching and learning, they're also encountering real problems and resistance. Major hurdles include tech glitches, a lack of good training and support, connectivity issues, and a mismatch with the current curriculum, not to mention time constraints and other teaching challenges. This study's findings make it clear that to get the most out of these tablets in Tanzanian schools, we must address the identified challenges. Therefore, this study's findings are of beneficial to policymakers, teachers, and curriculum developers, researchers and all education stakeholders.

Keywords: ICT in Schools, Pedagogical Tool, Secondary Schools, Tablets, Teachers, Teachers' Attitudes, Use of Tablets

I. INTRODUCTION

In today's society, Information and Communication Technology (ICT) is no longer optional; it has become indispensable. It plays a vital role in transforming various socioeconomic aspects and sectors (Ali, 2013; Mondal & Das, 2021). Such transformation is evident across every sector, including business operations, educational enhancement, information dissemination, global connectivity, and the empowerment of individuals and communities, thereby reimagining governance dynamics (United Republic of Tanzania (URT), 2003). While the widespread use of ICT affects various sectors, the education sector is among them. The integration of ICT in the education Sector for teaching and learning has been witnessed in many countries (Tamim et al., 2015). Such integration is evident in governments' establishment of policies, procedures, and ICT infrastructure to enhance educational practices (Tamim et al., 2015). Many governments, including Tanzania, establish policies, procedures, and ICT infrastructure to enhance educational practices and development (Tamim et al., 2015). Such establishment includes the formulation of ICT policies in education, replacement of old chalkboards with interactive digital whiteboards, use of students' personal smartphones, laptops, tablets, and e-readers for learning, and an innovative flipped classroom model where students watch lectures at home on a computer and use of classroom time for more interactive exercises (URT, 2003).

Tanzania is not left behind in such developments and also actively supports the integration of ICT in Education (Ali, 2013). In recent years, various policies have been developed and implemented. Three policy documents underline the significance of ICT implementation within the Tanzanian education Sector: The ICT policy for Basic Education of 2007 (United Republic of Tanzania (URT), 2007), the Tanzanian ICT policy of 2016, and the national Education and Training Policy of 2014 (URT, 2015). All emphasize the effective use of ICT in teaching and learning across all levels and diverse learning contexts, as well as in teacher education and curriculum development (Ali, 2013). In addition,



Tanzania's vision aims to provide a "smart class" for every school (URT, 2022). Many efforts are underway to equip every child across all levels of education with laptops (URT, 2022). This includes primary and secondary schools, universities, and vocational training institutes.

The government has managed to establish ICT infrastructure, including an extensive optical fibre backbone spanning 8319 km across the country, the national ICT data centre (NIDC), and submarine cables like EASSY and SEACOM, the nation is uniquely positioned to facilitate the adoption of new technologies at reduced cost and expedite the expansion of broadband connectivity to rural areas (URT, 2021). The government organizes many training sessions, workshops, and seminars to train teachers, tutors, and the education management. All these are to bring to life the use of ICT in Education. In general, Tanzania has invested much in ICT equipment and training within its schools. For example, it has distributed digital technologies to primary and secondary schools, including desktop computers, smartphones, laptops, printers, photocopiers, projectors, and televisions (Manyengo, 2021). Such impressive groundwork establishes a solid foundation for the widespread use of ICT in education. Moreover, it points out that Tanzania's commitment to leveraging ICT for the advancement of its education sector and beyond (Ibid.).

There are many efforts to digitise resources to enhance teaching and learning and to uplift digital literacy among teachers in primary, secondary, and technical secondary schools (Manyengo, 2021). Manyengo (2021) points out that a significant hurdle is the effective integration of these digital competencies into the teaching and learning process. Many teachers use digital tools for simple tasks such as exam typing and managing exam results. Lytle (2012) suggests that to increase the use of ICT, there is a need for intentional technology training in our teacher preparation programs. Many teachers are less familiar with how to best integrate technology into instruction and assessment. This is linked to their training at colleges and universities. However, they have been trained in basic technical and elementary skills, often overlooking gaps in pedagogical practices. Tanzania is aware of this challenge and has made significant efforts to address it. For instance, to improve the ICT skills of tutors and lecturers, short-term retooling and in-service training were implemented in 2015-2016 (URT, 2018). This proactive approach by the government helped bridge the gap and empower teachers with the skills required to use ICT tools effectively in the classroom.

While all these efforts are underway, the world is rapidly changing, and technological innovations are spreading everywhere. Moreover, the most recent innovation is the adoption of tablets in education. Tablets are thought to support and improve teaching and learning processes (Ali, 2013). The availability of low-cost educational software (Apps) that can be installed on tablets makes these tools helpful for educational purposes (United Nations Environmental, Scientific and Cultural Organization [UNESCO], 2023). In addition, tablets enhance teaching and learning experiences, expand access to pedagogical techniques, and improve educational administration. The use of tables has been rapidly increasing in the education sector. Tamim et al. (2015) note that countries such as Antigua & Barbuda, Australia, Brazil, India, and Iran are involved. Jamaica, Pakistan, Russia, Turkey and the United Arab Emirates have embraced Tablet initiatives as an integral part of their educational strategies. Similarly, in the USA, less expensive tablets for widespread use in schools have been adopted (Ditzler et al., 2016).

Tanzania is not left behind in tablet use; it made notable investments in ICTs and teacher training by distributing 293,400 tablets during the 2022 fiscal year. This is evidence of its commitment to improving teaching and learning through ICT. The distribution of these tables is as follows: 185,404 tablets designated for primary school teachers, 89,805 for secondary school teachers, and 1,666 for school quality assurance officers, 1,353 for rectors in public teachers' colleges, 297 for reactors in community development colleges, 5772 for education officers at regional, district and ward levels, 996 for vocation Education Training Authority personnel and 8,357 for the national Examination Council of Tanzania members. Surely, this demonstrates Tanzania's commitment to leveraging ICT to advance its education sector and beyond. Despite these efforts, teachers have yet to realize the full potential of tablets as pedagogical tools for teaching and learning.

The use of tables in education has recently become a focus of research. Many studies have examined the impact of tablets on students' performance (Ali, 2013; Haßler et al., 2015; Walczak & Taylor, 2018; Mulet et al., 2019; Nowfeek & Mahrool, 2021). Remember that the device itself does not solely determine the effectiveness of tablets; it depends on how they are used for educational purposes (Schmid et al., 2014). On the other hand, it depends on teachers' attitudes toward using tablets as a pedagogical tool. Tablets are most effective when they serve as cognitive support rather than just presentation tools in the hands of a user with the right attitude. While there are various studies on how teachers use tablets in their teaching practice, there is limited research on their attitude towards using tablets as a pedagogical tool. As a result, the actual use of tablets in schools is lower than the number the government of Tanzania invested in distributing. This variation is, hopefully, due to the teacher's attitudes towards the use of tablets; this is why this research was conducted.

In Tanzania, few studies focus on the use of tablets in primary schools, and none on teachers' attitudes towards their use in secondary schools. Therefore, understanding teachers' attitudes toward the use of tablets as a pedagogical tool in secondary school teaching and learning is an important step toward guiding proper technology use and developing enhanced teaching and learning tools. The current study attempts to bridge this gap by exploring teachers' attitudes



toward the use of tablets as a pedagogical tool in teaching and learning. Therefore, this study aims to investigate teachers' attitudes toward the use of tablets as a pedagogical tool in teaching and learning.

1.1 Research Objectives

- i. Examine what digital tools teachers own to facilitate teaching and learning;
- ii. Identify teachers' attitudes on using tablets in teaching and learning.
- iii. Determine the level of teachers' competence in using tablets for teaching and learning;

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Constructivist Learning Theory

The current study is guided by Constructivist Learning Theory (CLT). CLT was discovered by Jean Piaget in 1972. Constructivist Learning Theory posits that learners actively construct their own understanding and knowledge of the world through experience and reflection, rather than passively absorbing information (Jumaah, 2024). It was further expanded by Lev Vygotsky, a social constructivism in 1978. This theory is a student-centered approach that emphasizes that new information is built upon prior knowledge and experiences. This study, however, will serve as the main guiding framework. It helps to understand how teachers interact and adopt Tablets for teaching and learning activities.

CLT reveals that, in this study, teachers are not passive recipients of knowledge but actively construct their understanding through their interactions. As noted by Jumaah (2024), such interactions with the environment in which teachers live and work can generate more knowledge. By using tablets, teachers can gain more knowledge. The theory suggests that if teachers engage proactively with tablets, they will discover how to use them and enhance their teaching and learning methods. Through engagement with tablets, teachers can improve instructional strategies, gain more resources, and reflect on their experiences with peers. This will increase their competence in the integration of tablets in teaching and learning (Kaur, 2017)

Teachers face various challenges in integrating tablets into teaching and learning. To understand these challenges, the constructivist learning theory is the better choice, especially when examining challenges. As Kaur (2017) noted, teachers encounter various challenges in using tablets. From their experiences, learners can derive valuable insights, including failures, successes, and challenges. Finally, constructivist learning theory helps determine teachers' attitudes toward tablet use by clarifying the interaction between teachers and tablets (Kaur, 2017; Jumaah, 2024). In this study, the constructivist framework is used to explore how teachers perceive and respond to these challenges. It allows us to dwell on how these challenges prompt teachers to engage in problem-solving, seek assistance or guidance, and adapt their teaching techniques. This adaptive process can lead to meaningful changes in their pedagogical approaches (Dhital, 2018).

Given the opportunities teachers can gain from using Tablets in teaching and learning in Education, this study is guided by constructivist principles. Using this theory, we examined how teachers harness these devices to create engaging, authentic learning experiences. It also helps explore how teachers design learning activities that actively encourage students to construct knowledge through interactions with tablet technology. The constructivist learning theory was regarded as the best choice for this study, as it acknowledges that teachers are active participants in integrating tablets into their teaching practices and emphasizes experiential learning, reflection, and adaptability as essential components for developing competence and addressing challenges. Constructivism highlights the potential of technology to facilitate authentic and meaningful learning experiences, a point that is pivotal to our exploration of the opportunities afforded by tablet use in education.

2.2 Empirical Review

The influence of ICT is pervasive and far-reaching. It has impacted almost every aspect of our lives, including Business, where E-commerce, online communication, and data analytics have transformed how businesses operate and interact with customers (Kaur, 2017). Electronic medical records, remote consultations, and telemedicine have improved access to and delivery of healthcare (Saidu et al, 2017). Agriculture enables farmers to access weather forecasts, market information, and expert advice through mobile apps (Huisinga & Martin, 2017). ICT enables predictive maintenance, efficient supply chain management, and intelligent production techniques, enhancing productivity while reducing costs and errors (Kaur, 2017). Social media, instant messaging, and video conferencing have made communication faster, easier, and more global. In Education, online learning platforms, digital resources, and interactive tools have revolutionized teaching and learning. Therefore, the world of ICT is constantly evolving, with new technologies always emerging. Artificial intelligence, big data, virtual reality, and the Internet of Things (IoT) are just a few examples of cutting-edge developments that promise to further transform our lives.



2.2.1 ICT Tools for Teaching and Learning

The range of ICT tools used in classroom teaching has increased quite rapidly over the years. ICT tools in education include digital technologies, software, applications, devices, and platforms that help individuals to learn and communicate. These tools are effective in making students' learning interactive, student-centred, flexible, and accessible to everyone. ICT tools refer to hardware and software communication resources, such as computers (desktops, laptops), photocopy machines, data projectors, interactive whiteboards, Word Processing, the Internet, tape recorders, cell phones, and social media apps, specifically WhatsApp, which are used for the purpose of teaching and learning (Posavec, 2021; Chumillas, 2022). Each ICT tool has its own purpose, e.g., editing images, digital drawing, creating illustrations, and developing mind maps. They are used in education as assets to enrich the teaching process. ICT tools are the latest technologies, devices, and concepts used in Information and Communication Technology for student-to-student, student-to-student, and student-to-teacher interactions (e.g., flipped classroom, mobile apps, and clicker devices). Educators don't need every new piece of hardware to integrate technology effectively. Some of the ICT tools for teaching and learning are already sitting in your classroom, as summarized in Table 1 below

Table 1

The ICT Tools for Teaching and Learning

Category	ICT Tools	Uses	Citation(s)
Hardware	Computers (Desktop and laptops & Scanners:	For typing, word processing, drawing programs, coding, and internet searches	Siddiqui (2024) Ahmad & Qureshi (2024)
	Tablets or smartphones	Ideal for photography, video creation, AR apps, QR code hunts, storytelling	Ahmad & Qureshi (2024)
	Interactive whiteboards	For shared drawing, shape recognition, or interactive lessons	Siddiqui (2024)
	Digital projectors and cameras	For classroom presentation, as well as Perfect for outdoor documentation and science exploration	Ahmad & Qureshi (2024). Mei et al (2019)
	photocopy machines & Printers	Special for photocopying and printing	Ahmad & Qureshi (2024) Mei et al (2019)
	Digital microphones or audio recorders	Used for oral storytelling, nature walks, and reflection recordings	Mei et al (2019); Ahmad & Qureshi (2024)
Software	Programmable toys (e.g., Bee Bots, Blue Bots)	Excellent for early coding, problem-solving, and storytelling	Mei et al (2019)
	learning management systems, word processors, presentation tools	For productivity, typing, learning, presentation, and many more	Siddiqui (2024) Ahmad & Qureshi (2024)
	Simple educational games and simulations	Great for building logical reasoning and digital fluency	Mei et al (2019)
	photocopy machines & Printers		Siddiqui (2024)

2.2.2 Teachers' Attitudes Towards the Use of Tablets in Teaching

Attitude refers to the particular way a person thinks or feels about something or someone. This could be a set of emotions, beliefs, and behaviours towards a particular object, person, thing, or event. Siddiqui (2024) conducted a study on "teachers' perceptions on the use of tablets in enhancing teaching in public secondary schools in Lushoto District Council". Using a survey research design and a quantitative research approach, the findings revealed that teachers overwhelmingly agree that tablets are beneficial, enhancing task efficiency, teaching quality, and productivity. Also, they perceived tablets as easy to use with clear, understandable interactions and straightforward navigation. The attitude towards the use of Tables in Teaching and learning has been a key factor in the adoption of ICT in education. The more teachers' attitudes change, the more tablets will be used in teaching and learning. Mugo et al. (2017) examined the factors influencing teachers' attitudes towards integrating tablets into their classrooms. The study found that teachers use tablets because they facilitate their teaching and provide equal access to the Internet and educational technology for students in rural schools. Furthermore, there was diversity in teachers' attitudes towards tablets, influenced by factors such as technical support and the availability of suitable educational resources. Kaban and Ergul (2020) investigated 'Teachers' attitudes towards the use of tablets in six EFL classrooms. The aim was to identify the factors affecting EFL teachers' use of tablets, their attitudes towards these devices, and the advantages and disadvantages they see in using tablets in their teaching. The study focuses on teachers' perspectives, as they are largely ignored in the introduction of new technologies in educational institutions (Kaban & Ergul, 2020).

Mwakapemba et al. (2024) investigated teachers' perceptions of tablet use for educational purposes in Tanzania and identified three key variables: knowledge and skills in using tablets; the school's environmental support and the



sustainability of tablet use; and teachers' attitudes towards using tablets. The study used the Technology Acceptance Model (TAM) to investigate teachers' attitudes towards the use of tablets in the teaching and learning process. 81 respondents participated in the study, and the sample was selected from five zones (North, South, West, East, and Central). The data were analyzed quantitatively using WinSteps version 5.7.0 through the Rasch Model. Results found that (-0.18) of teachers had high knowledge and skills in the use of tablets, (-0.032) teachers agreed that the environment supports internet, electricity and accessibility of internet bundle on the use of tablets, and (-1.09) there was a strongly agreed for the acceptance of the use of tablets while (+0.47) teachers disagreed for the acceptance of the use of tablets for educational purposes in Tanzania (Mwakapemba et al, 2024).

2.2.3 Competences in the Use of Tablets in Teaching

Competence in education refers to the skills, talents, and knowledge that educators possess to fulfil their teaching duties proficiently. In the context of using tablets as an educational tool, competency is defined as the set of skills and abilities that educators possess or ought to cultivate to systematically integrate technology into the classroom (Revuelta-Domínguez et al, 2022). Kalogiannakis and Papadakis (2019) classified tablet competencies into two categories: fundamental tablet skills and advanced tablet abilities. Fundamental tablet competencies encompass utilizing search engines for information retrieval, employing presentation software, engaging in online communication, and operating word processing applications, among others (Aslan & Zhu, 2016). Advanced tablet competencies encompass using simulated tasks for discovery, experience, and experimentation; selecting and assessing educational software; formulating lesson plans using ICT; and possessing the requisite knowledge and skills to integrate ICT into pedagogical practices. Educators proficient in both fundamental and advanced tablet skills are more likely to utilize tablets as pedagogical tools (Kalogiannakis & Papadakis, 2019). Smarkola (2008) contended that educators must progress from mere "computer literacy" to "technology competence" to incorporate technology effectively into education.

Smarkola (2008) examined faculty use of tablet technology in pharmacy teaching at Northeastern University's School of Pharmacy in Boston, Massachusetts. The results indicated that the majority of faculty members utilized iPads for student engagement (86%), annotating papers/projects (68%), assessment (57%), and presenting practical tools (36%). In instructional contexts, 61% of professors utilized iPads in seminars or laboratories, 57% in immersive environments, and 43% in classrooms. The research conducted by Aslan and Zhu (2016) in Belgium analyzed the ICT skill levels of pre-service and in-service educators. The research indicated that pre-service teachers demonstrated greater proficiency in fundamental ICT skills (e.g., presentation skills, word processing) than novice teachers. While the preservice teachers demonstrated greater proficiency in using integrated ICT skills (e.g., employing simulated activities for discovery, experimentation, and experiential learning), the teacher groups did not exhibit equivalent competence in these skills.

Mwakapemba et al (2024) performed a study on tablet utilization in secondary mathematics education at Assumption College in the Philippines. The findings revealed that 95% of teachers did not use their tablets to create teaching materials. Furthermore, 70% of educators had never used tablets to manage school records, while 65% had not used them to create presentations or assign tasks. The results indicated that educators felt more comfortable and confident when using tablets for basic tasks, such as computations and note-taking. Rikala et al. (2013) investigated tablet integration at educational institutions in Finland. The research indicated that actual tablet utilization was far lower than teachers had initially expected, highlighting discrepancies in digital behaviour among educators. The study's findings also revealed discrepancies in teachers' digital behaviours across educational institutions. These studies jointly emphasize the importance of teacher proficiency in tablet integration, the disparities in tablet use across educational settings, and the need for effective professional development to address knowledge gaps and enable successful tablet integration in pedagogy.

2.2.4 Tablets as Pedagogical Tools: Advantages and Disadvantages

Tablets have evolved into practical educational tools, providing interactive learning, access to resources, and adaptability in instructional approaches (Ali, 2013). In regions such as Tanzania, obstacles including infrastructural deficiencies, the applicability of the content, and inadequate training impede their effective incorporation into education (MoEVT & UNESCO, 2015; MoEVT, 2023). The effective utilization of tablets requires strategic pedagogical methodologies, as research indicates that educators have an inadequate understanding of the pedagogy of technology integration (Nowfeek & Mahrool, 2021). Furthermore, another study asserts that teachers must demonstrate proficiency and confidence in their technical, pedagogical, and content knowledge to implement tablets in educational settings successfully (Anagiün, 2018). Despite extensive research on the application of Information and Communication Technology, particularly digital tools such as tablets, in educational contexts, a notable research gap persists regarding educators' attitudes towards tablets as pedagogical instruments. This gap is underscored by the varying challenges and implications of teaching across different student populations and educators' beliefs.



III. METHODOLOGY

3.1 Research Design

This study used a quantitative research approach and a survey research design. Oranga and Matere (2025) defined quantitative research as a systematic investigation that utilizes numerical data and statistical techniques to determine relationships between variables and draw conclusions about the phenomena under study. It aims to quantify observations, measure variables, and generalize findings to wider populations through statistical, mathematical, or computational techniques. Both quantitative and survey research designs are used to objectively measure variables, test theories, and identify patterns through statistical analysis of numerical data, enabling researchers to generalize findings (Oranga & Matere, 2025). The choice was made for its ability to provide precise, replicable, and unbiased insights, enabling evidence-based decision-making and predictive analysis.

3.2 Target Population

The study was done in Tanzania. The target population encompassed 254 secondary schools. The secondary schools comprise 151 public and 103 private. The study used 758 secondary school teachers, of whom 348 were female and 410 were male (Basic Education Statistics of Tanzania [BEST], 2020).

3.3 Sampling Techniques and Sample Size

The study used random sampling methods to select respondents and public Secondary schools involved in the study. Oranga and Matere (2025) also define random sampling as a process in which the population is divided into fixed periodic intervals. A decision is made to select every tenth participant from the population. This implies that the population will be divided into a fixed periodic interval scale (Oranga & Matere, 2025). An effective sample size calculation is the underlying principle in the planning of the research (Oranga & Matere, 2025). This reinforces the importance of ensuring that insufficient attention to the accuracy of sample size calculations may yield flawed results rather than significant findings. This study opted for the most widely used efficient method for determining the sample size needed to be a fair representative of the given population; that is, the National Education Association (Neagu) formula was chosen. National Education Association (NEA) formula: The formula is:

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}, \text{ where:}$$

S = Required sample

X^2 = Table value of chi-square for 1 degree of freedom at the desired confidence level

N = Population size

P = Population portion (assumed to be 0.50, since this would provide the maximum sample size)

D = Degree of accuracy as a proportion (0.05).

When using the NEA formula, cognizance must be taken of the sample size relative to the population size. As the population size grows, the sample size increases at a diminishing rate and stabilizes at slightly more than 380. As a result, the study used 758 secondary school teachers.

3.4 Data Collection Instrument

To investigate teachers' attitudes, competencies, challenges, and opportunities related to tablet use in teaching, a 21-item instrument was administered to secondary school teachers. These items were designed as statements and rated on a five-point Likert scale, ranging from "1 - Strongly Disagree" to "5 - Strongly Agree." The survey was conducted among 758 public and private secondary school teachers from 254 selected schools in Tanzania. Data were collected from primary sources via questionnaires and secondary sources through document reviews. Validity was ensured through established scales, focus groups, and literature, while reliability was addressed through consistent methodologies and trustworthiness measures.

3.5 Data Analysis

The collected quantitative data and participant responses were analyzed rigorously using the Statistical Package for the Social Sciences (SPSS) version 20.0, with descriptive statistics. This analytical approach facilitated the extraction of valuable insights from the data, allowing for a comprehensive examination of teachers' competencies, challenges, and opportunities in using tablets for teaching.

3.6 Informed Consent and Ethical Considerations

It is important to note that participation in this study was entirely voluntary, and participants had the right to withdraw their consent at any point, for any reason, without facing any obligations or consequences. At the outset of the research, both the researchers and participants engaged in the informed consent process. During this process, participants



received detailed information about the study's purpose, goals, and objectives. They were explicitly instructed to provide their responses with clarity and honesty. In addition, ethical considerations included obtaining research clearance, protecting participant confidentiality, and fostering a respectful and open research environment.

IV. FINDINGS & DISCUSSION

4.1 Demographic Information

This section delineates the demographic data of the respondents. The information presented pertains to the type of school, number of teachers, educational level, and teaching experience, with the significance of each category elucidated.

4.1.1 Type of School and Number of Teachers

As detailed in Table 2 below, the study involved 758 secondary school teachers from 254 secondary schools in the Morogoro region. Among these participants, 348 were female, and 410 were male.

Table 2

Demographic Characteristics of the study

School Type	No of schools	No of Teachers		
		Male	Female	Total
Public	151	209	201	410
Private	103	165	183	348
Total	254	374	384	758

4.1.2 Educational Level and work Experiences

Educational Level

The participants' educational level was important to know, as it served as a key indicator of the basic Information and Communication Technology knowledge teachers acquired in their educational institutions. As shown in Table 2, the study found that 123 (16.2%) teachers had a certificate-level of education, 312 (41.2%) had a Diploma, 237 (31.3%) had a Bachelor's degree, 73 (9.6%) had a master's degree, and 13 (1.7%) had a doctoral degree. This implies that teachers' educational level appears to be a significant factor influencing their ICT knowledge, with a higher percentage of those with diplomas (41.2%) included in the study. This is based on a study by Lubuva et al. (2022), which concluded that to improve the teaching-learning process, teachers need continual professional development to align with new pedagogies and learning technologies.

Working Experiences

On the other hand, the study also examined the teachers' working experiences. The duration of work in a similar field was important, as it would foster a deep understanding of various issues in teaching and learning and facilitate the easy detection of pedagogical transitions from traditional to technologically integrated approaches. It was found that majority of the participants in teaching experiences ranges from less than 5 years were 173 (22.8%), 5-10 years were 120 (15.84%), 11-15 years were 114 (15.0%), 16-20 years were 170 (22.4%) and more than 20 years were 181 (23.9%) as displayed in Table 3. This demographic distribution suggests a balance between beginners and more experienced educators, providing a diverse perspective on technology adoption in teaching and learning. This finding is supported by the study of Aslan and Zhu (2016), which found that experienced teachers have low adoption of integrating Information and communication technology, such as tablets, into their teaching.

**Table 3***Distribution of Teachers' Working Experiences and Education Level*

Working Experience	Educational Level					Total
	Certificate	Diploma	Bachelor	Masters	Doctoral	
Less than 5 years	9 (1.2%)	31 (4.1%)	98 (12.9%)	28 (3.7%)	7 (0.9%)	173 (22.8%)
5-10 years	21 (2.8%)	12 (1.6%)	63 (8.3%)	21 (2.8%)	3 (0.4%)	120 (15.8%)
11-15 years	12 (1.6%)	42 (5.5%)	47 (6.2%)	11 (1.5%)	2 (0.3%)	114 (15.0%)
16-20 years	36 (4.7%)	103 (13.6%)	21(2.8%)	9 (1.2%)	1 (0.1%)	170 (22.4%)
More than 20 years	45 (5.9%)	124 (16.4%)	8 (1.1%)	4 (0.5%)	0 (0%)	181 (23.9%)
Total	123 (16.2%)	312 (41.2%)	237 (31.3%)	73 (9.6%)	13 (1.7%)	758 (100%)

4.2 Digital Tools Teachers' Own to Facilitate Teaching and Learning

Table 4 presents the results on teachers' ownership of Digital Tools in Secondary schools in this study.

Table 4*Status of Teachers Owning Digital Tools*

Type of Digital Tool	Number of owners	Owners in percent (%)
Tablets	708	93.4%
Smartphone	734	96.8%
laptop	176	23.2%
Desktop computer	43	5.7%
Digital Photocopier	7	0.9%
Digital Projector	2	0.3%
Others	41	5.4%

Table 4 above shows that most secondary school teachers own more than one electronic device, such as a smartphone, laptop, desktop computer, or tablet. The highest response rate for tablets was among 758 respondents (708), at 93.4%, who own tablets and other electronic devices. At the same time, 734 teachers (96.8%) own smartphones and other electronic devices; 176 teachers (23.2%) own laptops and other electronic devices; and 43 teachers (5.7%) have desktop computers; 7 teachers (0.9%) have digital photocopier; 2 teachers (0.3%) own digital projector and 41 teachers (5.4%) owns other digital tools such as digital presentation pen, digital camera for content creation, and others. This finding shows that smartphones and tablets are even more relevant to secondary school students than other electronic devices, as noted by Aslan and Zhu (2016).

4.2.1 ICT Tools and Ownership

Table 5 presents the results on how teachers get Digital Tools in Secondary schools in this study.

Table 5*ICT Tools and Procurement*

ICT Tool	How Did you get				Total
	from Government		Bought Myself		
	Female	Male	Female	Male	
Tablets	297 (39.2%)	220 (29.0%)	87 (11.5%)	104 (13.7%)	708 (100%)
Smartphones	0 (0%)	0 (0%)	384 (52.3%)	350 (47.7%)	734 (100%)
Laptop	0 (0%)	0 (0%)	72 (40.9%)	104 (59.1%)	176 (100%)
Desktop Computer	0 (0%)	0 (0%)	49 (6.5%)	84 (11.1%)	133 (17.5%)
Digital Photocopier	0 (0%)	0 (0%)	0 (0%)	7 (0.9%)	7 (0.9%)
Digital Projector	0 (0%)	0 (0%)	0 (0%)	2 (0.3%)	2 (0.3%)
Others	0 (0%)	0 (0%)	13 (1.7%)	28 (3.7%)	41 (5.4%)

As shown in Table 5 above, most secondary school teachers who own tables have received them from the government. In contrast, among 708 respondents, 73% (517 teachers) received tablets from the government, and 27% (191 teachers) bought their own. The finding shows the government's relevance in providing teachers with tablets to enhance teachers' learning and the accessibility of materials, and in enabling teachers to integrate the tablets with the



Learning Management System. However, as you can see from Table 5, in addition to tablets, teachers also own other electronic devices, which they purchase with their own funds (not provided by the government). The study revealed that 384 female teachers (52.3%) and 350 male teachers (47.7%) own smartphones, for a total of 734 of 758 teachers. Also, the study revealed that 176 teachers own laptops, 133 own desktop computers, 7 own digital photocopiers, 2 own digital projectors, and 41 own other types of electronic devices, such as digital cameras.

4.3 Teachers' Attitudes on the Use of Tablets in Teaching and Learning

The second objective of this study was to understand Teachers' Attitudes on the Use of Tablets in Teaching and Learning. The study looked on perceived usefulness of tablets in teaching and learning, perceived ease of use of tablets in Teaching and Learning, Factors that Influence Teachers' behaviour Intention to Adopt Tablets in Teaching and Learning, and attitudes Toward Using Tablets in Teaching and Learning. All these are discussed in section 4.4.1 to 4.4.4 below.

4.3.1 Perceived Usefulness of Tablets in Teaching and Learning

The perceived usefulness of Tablets in Teaching and Learning in secondary schools is shown in Table 6. To gain insights into these, we conducted a survey in which participants responded to ten statements, each rated on a 5-point Likert scale (1 = Strongly Disagree [SD], 2 = Disagree [D], 3 = Neutral [N], 4 = Agree [A], and 5 = Strongly Agree [SA]).

Table 6

Perceived Usefulness of Tablets in Teaching and Learning

Items	SD		D		N		A		SA		Mean	Std. Dev.
	n	%	n	%	n	%	n	%	n	%		
Tablets enable me to accomplish tasks more quickly when searching for teaching and learning materials	46	6.1	19	2.5	32	4.2	103	13.6	558	73.6	4.46	1.10
Tablets have improved the quality of teaching and learning within our school	31	4.1	17	2.2	31	4.1	123	16.2	556	73.4	4.53	0.98
Tablets make it easier for me to innovate in teaching and learning methods	49	6.5	62	8.2	23	3	107	14.1	517	68.2	4.29	1.24
Tablets have improved my teaching and learning productivity	76	10.0	57	7.5	27	3.6	131	17.3	467	61.6	4.13	1.36
Tablets give me greater control over the teaching and learning process	89	11.7	24	3.2	56	7.4	146	19.3	443	58.4	4.09	1.35
The use of Tablets increases the effectiveness of performing tasks related to teaching	21	2.8	43	5.7	22	2.9	142	18.7	530	69.9	4.47	0.99
Using tablets gives access to a lot of information relevant to their teaching and learning purposes	27	3.6	31	4.1	33	4.4	108	14.2	559	73.7	4.51	1.01
Tablets provide thorough information for teachers' purposes	37	4.9	61	8	31	4.1	107	14.1	522	68.9	4.34	1.17
The advantages of tablets in teaching and learning processes outweigh the disadvantages	26	3.4	46	6.1	47	6.2	145	19.1	494	65.2	4.37	1.06
Using tablets gives me easy communication to my peers and supervisors.	78	10.3	25	3.3	29	3.8	151	19.9	475	62.7	4.21	1.30
Overall											4.34	1.17

The mean score for perceived usefulness of tablets ($M = 4.34$, $SD = 1.17$) indicates strong agreement among both private and public secondary school teachers in Tanzania that tablets are valuable tools for teaching and learning. A mean value well above the scale midpoint (3.00) suggests that teachers perceive tablets as enhancing instructional quality, improving productivity, and increasing access to relevant educational information, which reflects strong technological and pedagogical competencies. According to the Technology Acceptance Model, high perceived usefulness strongly influences users' acceptance and effective utilization of technology in professional contexts (Davis, 1989; Venkatesh & Davis, 2000). The moderate standard deviation implies some variation in teachers' experiences, which may be attributed to contextual challenges such as unequal access to ICT resources, differences in institutional



support, or disparities between private and public schools. Nevertheless, the high overall mean indicates significant opportunities to improve teaching effectiveness and instructional innovation through the integration of tablets in Tanzanian secondary schools (UNESCO, 2018).

4.3.2 Perceived ease of use of tablets in Teaching and Learning

The perceived ease of use of Tablets in Teaching and Learning in secondary schools is shown in Table 7 below. To gain insights into these, we conducted a survey in which participants responded to six statements, each rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Table 7 below provides an overview of teachers' perceptions of the ease of use of tablets in educational settings for teaching and learning.

The findings on perceived ease of use show a high overall mean score ($M = 4.27$, $SD = 1.26$), indicating that both private and public secondary school teachers generally find tablets easy to use and to operate in teaching and learning. On a 5-point Likert scale, this high mean suggests that teachers experience minimal difficulty in navigating tablets and interacting with digital instructional content, reflecting adequate operational ICT competencies. Davis (1989) emphasizes that when users perceive a technology as easy to use, their confidence and likelihood of sustained usage increase. The observed standard deviation indicates moderate variability, suggesting that while many teachers are comfortable using tablets, some still face challenges with training, prior ICT experience, or technical support, particularly across different school settings. Despite these challenges, the overall positive perception highlights strong opportunities for wider technology integration in secondary education, provided that capacity-building initiatives and supportive infrastructure are strengthened (Teo, 2011; UNESCO, 2018).

Table 7

Perceived ease of use of tablets in Teaching and Learning

Items	SD		D		N		A		SA		Mean	Std. Dev.
	n	%	n	%	n	%	n	%	n	%		
My interaction with tablets in the teaching process has been clear and understandable	90	11.9	21	2.8	12	1.6	123	16.2	512	67.5	4.25	1.35
Tablets are easy to use	87	11.5	32	4.2	16	2.1	68	8.97	555	73.2	4.28	1.37
Teaching to operate with tablets was easy for me	76	10.0	45	5.9	27	3.6	109	14.4	501	66.1	4.21	1.34
The use of tablets for teaching and learning does not confuse me	69	9.1	56	7.4	19	2.5	153	20.2	461	60.8	4.16	1.31
Tablets are easy to navigate	17	2.2	56	7.4	45	5.9	143	18.9	497	65.6	4.38	1.03
Using tablets enables me to have more accurate information	23	3.0	61	8	32	4.2	167	22	475	62.7	4.33	1.07
Overall											4.27	1.26

4.3.3 Factors that Influence Teachers' Behaviour Intention to Adopt Tablets in Teaching and Learning

The behavioural intention to adopt tablets for teaching and Learning in secondary schools is shown in Table 8 below. To gain insights into these, we conducted a survey in which participants responded to four statements, each rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Table 8 below provides an overview of teachers' perceptions of the ease of use of tablets in educational settings for teaching and learning.

Based on the 5-point Likert scale, the overall mean score for behavioural intention to adopt tablets ($M = 4.69$, $SD = 0.79$) indicates a very high level of agreement among both private and public secondary school teachers in Tanzania regarding their intention to use tablets in teaching and learning. A mean value near the upper end of the scale suggests that teachers are highly motivated to continue using tablets and frequently do so when access is available, reflecting strong readiness and commitment to technology adoption. According to the Unified Theory of Acceptance and Use of Technology, behavioural intention is a direct and significant predictor of actual technology usage, particularly when users perceive clear performance benefits. The relatively low standard deviation further indicates consistency in responses across teachers, suggesting that this intention is widely shared despite differences between private and public schools. Overall, these findings point to substantial opportunities for successful and sustained integration of tablets in secondary school teaching.

**Table 8***Factors that Influence Teachers' Behaviour Intention to Adopt Tablets in Teaching and Learning*

Items	SD		D		N		A		SA		Mean	Std. Dev.
	n	%	n	%	n	%	n	%	n	%		
I intend to continue using tablets for the teaching and learning process to perform my job	21	2.8	9	1.2	12	1.6	108	14.2	608	80.2	4.68	0.81
I intend to frequently use tablets for the teaching and learning process to perform my job	8	1.1	23	3	16	2.1	89	11.7	622	82.1	4.71	0.75
Assuming I have access to tablets for the teaching and learning process, I intend to adopt it	11	1.5	12	1.6	27	3.6	91	12	617	81.4	4.70	0.74
Given that I have access to tablets for the teaching process, I predict that I would adopt it	19	2.5	18	2.4	19	2.5	76	10	626	82.6	4.68	0.84
Overall											4.69	0.79

4.3.4 Attitudes toward Using Tablets in Teaching and Learning

Another objective of this study was to examine attitudes towards the use of tablets in Teaching and Learning in secondary schools. As shown in Table 9 below, to gain insights into these, we conducted a survey in which participants responded to four statements, each rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Table 9 below provides an overview of teachers' perceptions of the ease of use of tablets in educational settings for teaching and learning.

The findings show a high overall mean score ($M = 4.66$, $SD = 0.85$), indicating that both private and public secondary school teachers hold strongly positive attitudes toward tablet use in teaching and learning processes. On a 5-point Likert scale, such a high mean indicates that teachers view tablets as valuable, worthwhile, and a wise instructional tool, reflecting favorable psychological and professional dispositions toward educational technology. Positive attitudes have been widely recognized as a key factor influencing teachers' acceptance and sustained use of ICT in classrooms (Teo, 2011). The moderate standard deviation suggests some variation in individual perceptions, possibly due to differences in teaching contexts, access to resources, or prior ICT experience. Nonetheless, the overall positive attitude underscores significant opportunities to scale up tablet-based teaching initiatives in Tanzanian secondary schools, especially when combined with targeted professional development and supportive policies (UNESCO, 2018).

Table 9*Attitudes toward Using Tablets in Teaching and Learning*

Items	SD		D		N		A		SA		Mean	Std. Dev.
	n	%	n	%	n	%	n	%	n	%		
I think positively about using tablets for teaching and learning processes	8	1.1	6	0.8	31	4.1	78	10.3	635	83.8	4.75	0.67
Tablets are a positive tool for the teaching process in our school	36	4.7	11	1.5	23	3	89	11.7	599	79.0	4.59	0.98
Using tablets for the teaching and learning process is a wise idea	13	1.7	17	2.2	27	3.6	91	12	610	80.5	4.67	0.80
Tablets are worth using within the teaching and learning process	21	2.8	27	3.6	19	2.5	76	10	615	81.1	4.63	0.91
Overall											4.66	0.85

4.4 Competences in Using Tablets in Teaching and Learning

As shown in Table 10 below, the study investigated the competencies in using Tablets in Teaching and Learning among Secondary School Teachers, and the findings indicate an overall mean score of 4.09 on a five-point Likert scale, which signifies a high level of agreement among respondents that they possess competencies in using tablets for teaching and learning. A mean value above 4.00 on a Likert scale is commonly interpreted as reflecting high competence or strong agreement (Likert, 1932; Boone & Boone, 2012). This suggests that secondary school teachers in Tanzania, across both public and private schools, generally demonstrate adequate skills in operating tablets, preparing instructional materials, and supporting teaching and learning activities. The overall standard deviation of 1.281 indicates moderate dispersion in responses, suggesting that although most teachers report high competency levels, there is some variation among individuals. Such variability may be attributed to differences in access to digital resources, ICT training



opportunities, or institutional support. Overall, the combination of a high mean and moderate standard deviation confirms that tablet competency among teachers is generally strong, though not evenly distributed, underscoring the importance of continuous professional development to enhance uniformity in digital teaching competencies.

The findings further revealed that teachers have a very strong foundation in basic tablet operations. These include turning the table on and off, selecting and preparing teaching materials. There are variations in their ability to use the tablets, as noted by Ditzler et al. (2016) and Lubuva et al. (2022). This variation is in the use of specific software, such as Microsoft Word. The results of this study align with those of two previous studies by Ahmad and Qureshi (2024) and Lubuva et al. (2022), which revealed challenges for teachers in using new ICT tools. Such challenges stem from a lack of training and support from top management.

Table 10

Competence in Using Tablets in Teaching and Learning

Items	SD		D		N		A		SA		Mean	Std. Dev.
	n	%	n	%	n		%	n	%			
I know how to turn on and off the Tablet	3	0.4	13	1.7	43	5.7	103	13.6	596	78.6	4.68	0.69
I can select and prepare teaching notices using a Tablet	57	7.5	29	3.8	57	7.5	117	15.4	498	65.7	4.28	1.22
I can use a Tablet to access online resources and various apps installed on it	60	7.9	64	8.4	32	4.2	126	16.6	476	62.8	4.18	1.30
I can use programs like Microsoft Word, PDF, and PowerPoint that are on the tablet	94	12.4	81	10.7	68	9.0	142	18.7	373	49.2	3.82	1.45
I can use the tablet to present a lesson using PowerPoint	78	10.3	79	10.4	71	9.4	134	17.7	396	52.2	3.91	1.40
I can search for study materials using the tablet	101	13.3	65	8.6	79	10.4	129	17.0	384	50.7	3.83	1.46
I can attach and send study materials to my colleague teacher using the tablet	83	10.9	71	9.4	62	8.2	136	17.9	406	53.6	3.94	1.41
I can save the file for future reference	72	9.5	52	6.9	54	7.1	147	19.4	433	57.1	4.08	1.33
Overall											4.09	1.281

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

The study examined how teachers in Tanzania feel about using tablets for teaching and learning and found a mixed picture. While some are excited about the benefits tablets can bring to teaching and learning, they're also encountering real problems and resistance. Major hurdles include tech glitches, a lack of good training and support, connectivity issues, and a mismatch with the current curriculum, not to mention time constraints and other teaching challenges.

The good news is that there's a clear link between tablet use and increased student engagement, suggesting the potential for these tools to transform the learning experience. As we move forward, it's all about striking a balance: we need to celebrate the potential benefits while actively tackling the known problems. This is the only way to ensure tablets become a sustainable and effective part of education in Tanzania. This will require ongoing research, conversations with policymakers, and collaboration to build a system in which tablets can truly shine as teaching tools.

Interestingly, the study shows that secondary school teachers in Tanzania are very positive about using tablets and feel they have the skills to use them. They see them as essential tools that help them teach more effectively, be more productive, and try out new, creative approaches in the classroom. Teachers report that tablets make their work more efficient, improve the quality of their lessons, and help them keep a better track of the learning process. What helps is that they also find the tablets easy to use and effective for getting information across clearly. The enthusiasm is so strong that many teachers are even willing to spend some of their modest income on tablets for their work.

To capitalize on this positive attitude, schools need to get more tablets into classrooms and invest in a solid ICT infrastructure. Teachers will need ongoing training to make the most of the devices, along with a system for monitoring and evaluating the impact of tablets on teaching and learning. If we resolve known issues, encourage teachers to learn from one another, and ensure the school administration provides reliable tech support, we can make tablets a powerful tool for improving teaching and engaging students.



5.2 Recommendation

This study's findings make it clear that to get the most out of these tablets in Tanzanian schools, we must address the identified challenges. First, regarding tech glitches, the study recommends that schools' top management support teachers. Second, regarding the lack of adequate training and support, the study strongly recommends full government commitment to providing professional training and support for secondary school teachers. Third, on the connectivity issues, it is recommended that the government of Tanzania should install fibre optic to the most important central schools, where teachers from nearby schools will visit and make use. It can also strengthen mobile internet connectivity by subsidizing companies that provide such services. Finally, regarding the mismatch with the current curriculum, the government should find a way to include Technology courses in colleges and teacher-training institutions. In addition, secondary schools should give teachers ample time and address teaching challenges in their respective schools. This means creating professional development that focuses on how to actually integrate technology into lessons and providing customized support for teachers as they learn to navigate this new digital world. On top of that, improving basic infrastructure is essential if we want to create an environment where tablets can be used successfully.

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