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Teachers' perceptions and attitudes on the use of tablet computers in teaching and learning process: Experiences from face-to-face sessions at Morogoro-campus in Tanzania

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Abstract

This study assessed teachers' perceptions and attitudes regarding integrating tablet computers into the teaching and learning process. A mixed-methods approach and a descriptive design were employed. The Technology Acceptance Model (TAM) was used to assess teachers' perceived usefulness, ease of use, behavioral intention to use, attitudes toward tablet computers, and challenges associated with the use of tablet computers in the learning and teaching process. Sixty-four (64) respondents participated in the study and were selected through purposive sampling during a face-to-face session held in December 2023 at Morogoro-Campus. Data in this study were collected using questionnaires and interviews. Quantitative data were analyzed using descriptive statistics, while qualitative data underwent thematic analysis. The findings revealed that teachers generally perceived tablets as effective teaching tools and expressed satisfaction with their use in the teaching and learning process. However, the study highlighted a lack of training for teachers on incorporating tablet computers into classroom. Key barriers included insufficient technical support, connectivity issues, and time constraints. 76.6% (f = 49) of the respondents believed that providing clear and appropriate information on how, when, and where to use tablets would enhance their effectiveness in teaching. Respondents also emphasized the importance of training teachers in the use of tablet computers to ensure that they are equipped with the necessary skills to integrate technology effectively into their teaching practices. The study recommends providing in-service training for teachers on utilizing tablet computers in education.

1. Introduction

For centuries, educators have sought tools to make teaching more efficient and effective. In ancient times, information was inscribed on stone, evolving over time to the use of paper, books, chalkboards, and

whiteboards. In recent decades, electrically powered devices like televisions, videos, and computers have gained prominence as classroom teaching aids. With the advent of the Internet, computers, particularly tablets have become standard in classrooms, enabling instant access to a vast array of information at the touch of a button. The introduction of touchscreen tablets has brought numerous benefits to education. For example, Simpson (2012) noted that the use of iPads in an American elementary school increased student enthusiasm for learning.

The rapid development of Information and Communication Technology (ICT) in the 21st century has profoundly impacted various sectors, including education (Siu & García, 2017). Innovations such as system integration, the industrial Internet of Things, augmented reality, autonomous robots, cybersecurity, and cloud computing have driven this transformation. These technologies enable faster, more efficient data collection and analysis, improving productivity and reducing costs (Scalabre, 2018). While technology has revolutionized many aspects of life, human involvement remains essential. Staying informed about technological advancements has simplified tasks and made modern tools like computers, projectors, interactive boards, and tablets indispensable in education. These tools prepare individuals for daily challenges and the job market. For instance, the interactive features of tablets, when integrated with devices like interactive boards, have made them valuable educational assets. Leveraging these technologies and the Internet equips learners to navigate and adapt to ongoing technological changes (Uzunboylu & Ozdamli, 2011).

Countries like the U.S.A., South Korea, England, Spain, Portugal, and Singapore have undertaken projects to explore the integration of tablet computers in education, given their potential utility (Çetinkaya & Keser, 2014; Ozdamli & Tavukcu, 2016). The effective use of tablets in educational settings is influenced by several interconnected factors, including infrastructure, software, hardware, national education policies, implementation strategies, and the attitudes of teachers and students. Despite their potential, qualitative research by Pamuk, Çakır, Ergun, Yılmaz, and Ayas (2013) revealed that classroom usage of tablets remains minimal. Additionally, some studies suggest that tablets may negatively impact teacher motivation and are often used for entertainment such as listening to music, watching movies, and playing games rather than for educational purposes.

Numerous studies have examined the use of tablets in education, evaluated lessons conducted with tablets, and analyzed students' perspectives. While mobile devices in classrooms appear to offer advantages, the "positive impact" of their introduction into formal education remains inconclusive. Some research highlights improvements in educational quality compared to traditional methods, while others lack sufficient empirical evidence to support such claims. Although many schools worldwide have adopted tablets in classrooms, there remains a shortage of research on effective implementation strategies (Pamuk et al., 2013).

This underscores the need to assess primary school teachers' perceptions and attitudes toward using tablets in classrooms. Understanding their views is crucial for successfully integrating tablets into education, identifying challenges, and developing solutions. This study assessed primary school teachers' perceptions and attitudes toward tablet use in Tanzanian classrooms. Specifically, it seeks to explore teachers' perceptions on the use of distributed tablets, identify external and internal factors affecting tablet computer adoption in classrooms, and find suggestions for the effective use of tablets.

The following research questions guided this research:
i. What are teachers' perceptions on the use of distributed tablet computers as teaching and learning tools?
ii. What are external and internal factors affecting tablet computer adoption in classrooms?
iii. What are the strategies for the effective use of tablets computers in classrooms?

2. Theoretical Framework
2.1. Technology Acceptance Model
The theory underpinning this study is the Technology Acceptance Model (TAM) which investigates how users' beliefs and attitudes influence their acceptance or rejection of information technology (Jairak, Praneetpolgrang, & Mekhabunchakij, 2009). The model conceptualizes teachers' technology acceptance as a complex phenomenon shaped by external (exogenous) and internal (endogenous) factors (Scherer, Siddiq, & Tondeur, 2019). Consequently, TAM provides a suitable framework for exploring teachers' attitudes toward technology, illustrating how their knowledge, beliefs, and perceptions about ICT impact their acceptance and usage of such tools.

In education, TAM has been extensively used to predict technology acceptance among teachers and students across contexts, including personal learning environments (PLEs) and mobile learning (Pires & Halawi, 2020). It remains a key framework for evaluating the adoption of learning technologies (Granić & Marangunić, 2019). TAM examines factors influencing acceptance, rejection, or continued use of technology (Ajzen & Fishbein, 1980) and provides theoretical insights into the relationships between attitudes, intentions, and behaviors. Perceived usefulness and ease of use are central determinants of user attitudes, directly influencing technology adoption (Saadé & Bahli, 2005). Over time, the model has been adapted with additional variables, making it applicable to various contexts and enhancing its explanatory scope (Hsu & Chang, 2013).

TAM is widely regarded as a robust and straightforward framework for explaining and predicting factors influencing users' acceptance of and behavior toward new technologies (Lazim, Ismail, & Tazilah, 2021; Venkatesh & Davis, 1996). It identifies perceived usefulness (PU) as the extent to which an individual believes that using a particular system enhances job performance (Davis, 1989) with greater usefulness leading to higher acceptance (Molobi, Kabiraj, & Siddik, 2020). Perceived ease of use (PEU) refers to the degree to which an individual believes that using a system requires minimal effort (Davis, 1989). Technologies that are easier to use tend to achieve greater acceptance (Molobi et al., 2020). In this model, PEU influences PU, and both factors shape the intention to use a tool, which subsequently affects actual usage behavior. Attitude toward use (ATU) reflects a user's willingness to engage with a specific technology (Venkatesh & Davis, 1996) and plays a significant role in the practical acceptance and efficiency of technology use (Kalayou, Endehabtu, & Tilahun, 2020). Behavioral Intention (BI), or the willingness to use new technology, depends on PU and PEU, with BI directly influencing usage behavior (Venkatesh & Davis, 1996). For instance, research on the flipped classroom methodology based on TAM demonstrates that when students accept this approach, learning becomes more effective, and positive attitudes are fostered in the classroom, validating TAM's relevance (Cabero-Almenara, Romero-Tena, Llorente-Cejudo, & Palacios-Rodríguez, 2021).

External variables also influence technology acceptance, including individual factors such as education level, school context, task characteristics, voluntary or mandatory learning environments (Lazim et al., 2021) and computer self-efficacy, where users tackle technological challenges with confidence despite difficulties (Papadakis et al., 2021). Additionally, demographic factors such as age, gender, confidence, personal skills, and prior experience with technology can hinder or facilitate mobile learning adoption in classrooms (Aldowah, Umar, Ghazal, Bervell, & Saif, 2020; Zalat, Hamed, & Bolbol, 2021). In this study, gender, age, and experience are critical factors influencing teachers' acceptance of tablet devices in teaching.

Yates (2009) notes that 70–80% of ICT projects fail due to a lack of user acceptance rather than technical issues. Similarly, Davis (1989) highlights the pivotal role of user acceptance in determining the success or failure of technological initiatives. These findings emphasize the need to address user acceptance prior to implementing ICT solutions. Over time, various theories, such as the Diffusion of Innovations Theory (DIT) (Rogers, 1995) the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) the Theory of Planned Behavior (TPB) (Ajzen, 1985, 1991) and Decomposed Theory of Planned Behavior (DTP) (Taylor & Todd, 1995) have been developed to enhance understanding of technology acceptance. Davis's original TAM model, illustrated in Figure 1, serves as the foundation for these discussions.
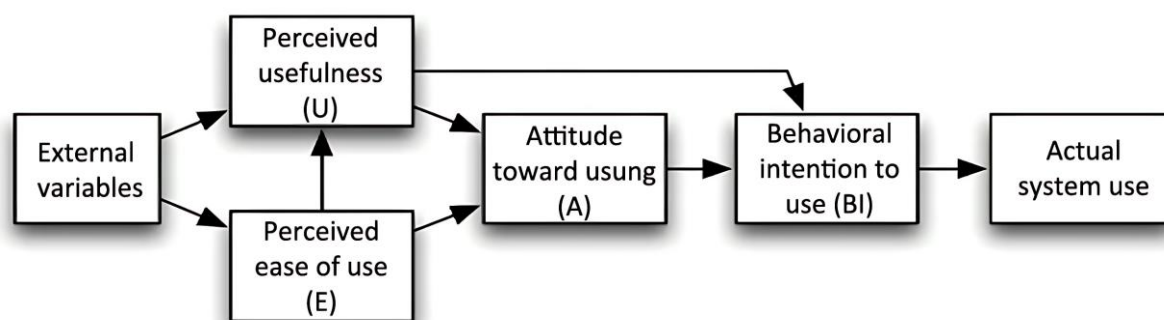

Figure 1. Technology acceptance model.

Source: Davis (1989).

3. Methodology

3.1. Research Approach and Research Design
The study employed a mixed-method approach integrating both quantitative and qualitative data. This approach can help researchers gain a more comprehensive understanding of their research topic by integrating data from multiple sources. According to Creswell and Creswell (2017) the mixed-method approach involves the collection and analysis of both numerical (quantitative) and narrative (qualitative) data. Additionally, a descriptive survey research design was adopted to support the investigation.

3.2. Research Sites and Participants
The participants in this study were primary school teachers from two Districts (Morogoro Urban and Rural) of Morogoro region, during a face-to-face (f2f) session at Morogoro-Campus in December 2023. The study population consisted of 64 teachers, of whom 29.8% were men and 67.5% were women. A purposive sampling technique was used to select those participants who used tablet computers in their teaching and learning process.

3.3. Sample Size

Bailey (1998) suggests that a minimum sample size of 30 respondents is sufficient for conducting statistical data analysis, regardless of the population size. Therefore, the sample size of 64 respondents in this study was deemed appropriate.

3.4. Data Collection

Data for this study were gathered in December 2023 during a face-to-face session. Questionnaires were used to collect responses from participants, incorporating the five constructs of the Technology Acceptance Model (TAM): Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), Behavioral Intention (BI), and barriers to integrating tablet computers in learning and teaching process.

In addition, in-depth interviews were conducted to gain deeper insights into teachers' perspectives on the use of tablet computers in classroom settings. The interview questions were open-ended, allowing participants to share varied experiences and viewpoints. Each interview lasted 10 to 20 minutes, was audio-recorded, and later transcribed for analysis.

3.5. Data Analysis

To address the research questions, the quantitative data from the 5-point Likert-scale items were grouped into five subcategories: teachers' perceived ease of use, perceived usefulness, attitudes toward use, behavioral intention to use, and barriers to integration. The survey results were compiled and analyzed statistically using the Statistical Package for the Social Sciences (SPSS) version 20. A descriptive analysis was conducted, focusing on calculating means and standard deviations. The mean was used to represent the average participant response, providing an overall measure of central tendency, while the standard deviation reflected the extent of variability within the data (Kolog, Tweneboah, Devine, & Adusei, 2018). Together, these measures offered insights into the consistency and diversity of participants' responses.

For the qualitative data, thematic analysis was employed as a widely used method for analyzing unstructured interview data (Braun & Clarke, 2006). This approach involves identifying, analyzing, and reporting patterns or themes within the data (Braun & Clarke, 2006). Direct quotations from interviewees were used to support the findings, with participants coded as Teacher 1 (T1), Teacher 2 (T2), and so forth.

3.6. Ethical Consideration

The study adhered to a series of ethical considerations before collecting data from the respondents. Before distributing the questionnaires, participants were presented with an informed consent form, which they were required to review and agree to before proceeding with the survey or interview. This process ensured that participants were fully aware of their rights and the study's objectives. Additionally, the researcher emphasized that all data collected would be treated with the utmost confidentiality and used solely for the purposes of this research. This approach safeguarded the privacy and trust of the participants while upholding the ethical standards of the study.

4. Findings

4.1. Teacher's Perceived Ease of use (PEOU) of Tablet Computers in Teaching and Learning Process

The quantitative findings on primary school teachers' perceptions of the perceived ease of use of tablets and computers in the teaching and learning process are presented in Table 1.

These findings are based on the five determinants of the Technology Acceptance Model (TAM): perceived ease of use, perceived usefulness, behavioral intention, attitudes, and barriers to tablet computer integration. The data reveal that respondents generally agree on the ease of using tablets, with a composite mean of 3.906, which is interpreted as "agree." Teachers strongly agree that their interaction with tablets is clear and understandable, as indicated by a mean of 4.141 and a relatively low standard deviation (0.924), suggesting a consistent view among respondents.

Other items, such as finding tablets easy to use with simple manual instructions (mean of 3.859), being able to find things on the tablet quickly (mean of 3.891), and believing that interacting with tablets does not require a lot of mental effort (mean of 3.734), also show agreement.

However, the standard deviations for these items, ranging from 0.978 to 1.238, suggest moderate variability in respondents' experiences. While many teachers find tablets easy to use, some may face occasional challenges. Overall, the data suggest that most respondents find tablets user-friendly and relatively simple to operate, which is advantageous for teaching and learning. The variability in responses indicates that while many educators are comfortable using tablets, additional support or training may be needed for some to ensure a consistently positive experience and further enhance ease of use.

Table 1. Teacher's perceived ease of use (PEOU) of tablet computers (n=64)

Item	Mean	Std. dev.	Descriptive interpretation
1.I find the tablet easy to use with simple manual instructions	3.859	1.194	Agree
2.It takes up short time for me to find things on the tablets	3.891	0.978	Agree
3.Interacting with tablets does not require a lot of my mental effort	3.734	1.238	Agree
4.My interaction with tablets is clear and understandable	4.141	0.924	Strongly agree
Composite mean	3.906	1.083	Agree

Note: 1.000 − 2. 500, Strongly disagree, 2.600-3.200, Disagree, 3.300 −3.400, Neutral, 3.500 − 4.000, Agree, 4.100 − 5.000, Strongly agree.

4.2. Perceived Usefulness of Tablet Computers

The results presented in Table 2 indicate that respondents generally agree that using tablets in teaching is beneficial, with a composite mean of 3.908, which is interpreted as "agree." Specifically, respondents strongly agree that teaching with a tablet consents them to accomplish tasks more quickly and efficiently (Mean = 4.141) and increases productivity (mean = 4.241), both with relatively low standard deviations (0.924), suggesting consistency in responses. Other aspects, such as the ability to develop teaching skills (Mean = 3.750), gaining greater control over work (mean = 3.891), and the usefulness of tablets in teaching practice (Mean = 3.891), were also positively received.

These items had standard deviations ranging from 0.978 to 1.113, indicating moderate variability in responses but still an overall positive sentiment. Items related to tablets helping to access additional teaching materials (Mean = 3.750) and their usefulness for teaching and downloading cartoons for educational purposes (Mean = 3.691) also received agreement, though opinions varied slightly, as reflected by the standard deviations (0.948 to 1.113).

Overall, the data suggest that while most respondents recognize the value of tablets in enhancing efficiency, productivity, and teaching effectiveness, there is some variability in how strongly these benefits are perceived. This indicates that while many educators view tablet use favourably, tailored support and resources may be needed to fully maximize their potential for all users.

Table 2. Perceived usefulness (PU) of tablet computers (n=64)

Item	Mean	Std. dev.	Descriptive interpretation
1.Teaching with a tablet enables me to accomplish tasks more quickly and efficiently	4.141	0.924	Strongly agree
2.The use of tablet helps me to develop my teaching skills	3.750	1.113	Agree
3.Teaching with a tablet gives me greater control over my work	3.891	0.978	Agree
4.Teaching with a tablet is useful in my teaching practice	3.891	0.978	Agree
5.It help me to access additional teaching materials	3.750	1.113	Agree
6.Teaching with a tablet increases my productivity in my work	4.241	0.924	Strongly agree
7.Tablets are useful for teaching and downloading cartoons useful for teaching students	3.691	0.948	Agree
Composite mean	3.908	0.997	Agree

Note: 1.000 − 2.500, Strongly disagree, 2.600-3.200, Disagree, 3.300 −3.400, Neutral, 3.500 − 4.000, Agree, 4.100 − 5.000, Strongly agree.

4.3. Attitude toward the use of Tablet Computers

As shown in Table 3, the overall perception of tablet use in teaching and learning is positive, with a composite mean of 3.799, which is interpreted as "agree." Respondents strongly agree that they feel positive about using tablets (mean = 3.859) and believe that using tablets for teaching and learning is a good idea (mean = 4.141). The ability to plan lessons better with a tablet received a high mean of 4.241, indicating that many respondents see this as a significant benefit, with a relatively low standard deviation (0.924), suggesting consistent responses.

Statements such as "studying through a tablet is a good idea" (mean = 3.891) and "a tablet makes my work interesting" (mean = 3.891) also received agreement, though with some variability. Other aspects, like tablets providing an attractive learning environment (mean = 3.734), enjoying working with a tablet (mean = 3.750), and finding tablet use fun and enjoyable (mean = 3.750), show general agreement, but with more variability (standard deviations ranging from 0.978 to 1.238), indicating differing opinions among respondents.

The item "when I start using a tablet, I find it hard to stop" had the lowest mean (2.930), suggesting neutral to slight disagreement. This could imply that respondents do not perceive tablet use as particularly addictive or engaging for continuous use. Overall, the findings suggest that while there is a favorable attitude toward using tablets for teaching, particularly for planning lessons and making work interesting, areas such as the continuous use of tablets may not resonate as strongly. The standard deviations reflect a mix of strong

agreement and varied experiences, indicating that while many educators are positive about tablet use, others may require further support or have mixed feelings about its benefits.

Table 3. Attitude toward the use of tablet computers (n=64).

Item	Mean	Std. dev.	Descriptive interpretation
1. I feel positive regarding the use of tablets	3.859	1.194	Strongly agree
2. Studying through a tablet is a good idea	3.891	0.978	Agree
3. Tablets provides an attractive learning environment	3.734	1.238	Agree
4. I believe it is (Would be) a good idea to use tablets for my teaching and learning process	4.141	0.924	Strongly agree
5. Once I begin using a tablet, I find it difficult to put it down.	2.930	1.182	Neutral
6. I enjoy using a tablet for work	3.750	1.113	Agree
7. Using a tablet adds excitement to my work.	3.891	0.978	Agree
8. Using a tablet is both enjoyable and entertaining	3.750	1.113	Agree
9. A tablet helps me plan my lessons more effectively.	4.241	0.924	Strongly agree
Composite mean	3.799	1.071	Agree

Note: $1.000 - 2.500$ Strongly disagree, 2.600-3.200, Disagree, $3.300 - 3.400$, Neutral, $3.500 - 4.000$, Agree, $4.100 - 5.000$, Strongly agree.

4.4. Behavioural Intention to use (BI)

The findings presented in Table 4 show that respondents generally have a strong positive attitude toward using tablet computers in their teaching, with a high composite mean of 4.526, interpreted as "strongly agree." Most respondents strongly agree with statements regarding their intention to use tablets when appropriate (mean = 4.850) and when given the opportunity (mean = 4.890), as well as their willingness to recommend tablet use to others (mean = 4.790). However, the mean of 3.574 for using tablets frequently suggests a slightly lower level of agreement, indicating that while many respondents are supportive, they may not yet fully embrace frequent usage. The standard deviations, ranging from 1.190 to 1.542, indicate moderate to high variability, revealing that while there is a strong consensus, some respondents express differing levels of enthusiasm. This variability suggests that not all educators are equally comfortable or experienced with technology, highlighting the need for training and support to bridge this gap. The implications of these findings point to a positive outlook for integrating tablet technology into teaching. However, they also emphasize the importance of addressing potential barriers and providing opportunities and resources to ensure consistent and effective adoption.

Table 4. Participants' behavioral intention to use (BI) (n=64).

Item	Mean	Std. dev.	Descriptive interpretation
1.I intend to use tablet computer if equipment and necessary technological support are available	4.850	1.190	Strongly agree
2.I intend to use tablet computer frequently during my teaching process	3.574	1.520	Agree
3.I will recommend to use tablet computer to others	4.790	1.542	Strongly agree
4. I plan to use tablet computer when given the opportunity during my teaching process	4.890	1.492	Strongly agree
Composite mean	4.526	1.436	Strongly agree

Note: $1.000 - 2.500$, Strongly disagree, 2.600-3.2, Disagree, $3.300 - 3.400$, Neutral, $3.500 - 4.000$, Agree, $4.100 - 5.000$, Strongly agree.

4.5. Barriers to Tablet Computer Integration

The data presented in Table 5 highlight the challenges that respondents face in using teaching tablets, with a composite mean of 4.008, interpreted as "strongly agree." The greatest level of agreement is observed regarding poor internet connectivity (mean = 4.658), with a relatively low standard deviation (0.754), indicating a strong consensus on this issue. Teachers also strongly agree that negative attitudes (mean = 4.241) and insufficient skills and confidence (mean = 4.141) present significant barriers to tablet use.

Further agreement is noted regarding inadequate training (mean = 3.850), lack of power sources (mean = 3.891), and the absence of projectors and screen casting (mean = 3.786), which are also seen as considerable challenges, though with slightly more variability in responses. Other challenges, such as lack of self-initiative (mean = 3.751) and teachers' readiness (mean = 3.750), are recognized as moderate barriers, with standard deviations ranging from 0.924 to 1.235, indicating some variation in individual experiences or perceptions. In conclusion, while there is widespread acknowledgment of specific barriers to tablet use in teaching, addressing issues like connectivity, training, and attitudes could improve the integration and overall effectiveness of tablet technology in educational settings.

Table 5. Barriers to tablet computers integration in the classroom (n=64)

Item	Mean	SD	Descriptive interpretation
1. Inadequate skills and confidence of using tablets	4.141	0.924	Strongly agree
2. Inadequate training	3.850	1.133	Agree
3. Lack of source of power to charge the tablets	3.891	0.978	Agree
4. Lack of self-initiative	3.751	1.076	Agree
5. Teachers readiness	3.750	1.113	Agree
6. Teachers' negative attitudes	4.241	0.924	Strongly agree
7. Poor internet connectivity	4.658	0.754	Strongly agree
8. No projector and screen casting	3.786	1.235	Agree
Composite mean	4.008	1.017	Strongly agree

Note: 1.000 − 2. 500, Strongly disagree, 2.600-3.200, Disagree, 3.300 −3.400, Neutral, 3.500 − 4.00, Agree, 4.100 − 5.000, Strongly agree.

4.5.1. TAM Model and Factors Affecting Teacher's use of Tablet Computers in Classrooms

The TAM model and the factors influencing teacher use of tablet computers in classrooms are outlined in Table 6. External factors in educational research refer to environmental elements such as surroundings and resources (Lasmanis, 1997). On the other hand, internal factors pertain to the researcher's objectives, motivation, interests, skills, and experience (Lasmanis, 1997). These factors play a significant role in shaping how teachers adopt and integrate tablet computers into their teaching practices.

Table 6. The TAM model and factors affecting teacher use of tablet computers in classrooms.

Categories		Total	Percentages(%)	
External factors	1.ICT facilities	12	18.8	59.4
	2.Teachers readiness	9	14.1	
	3.Charging system for this tablet computers is very low	4	6.3	
	4.Workload	8	12.5	
	5.Voluntary or non-voluntary learning environments	5	7.8	
Internal factors	1.Teachers' skills and attitudes	10	15.6	40.6
	2.Teachers interests	5	7.8	
	3.Confidence	7	10.9	
	4.Teachers' willingness to use tablets	4	6.3	

Table 6 highlights the external and internal factors that influence teacher use of technology in classrooms, as identified in the literature. The results indicate that external factors have a greater impact on teachers' use of tablets and computers in classrooms than internal factors. Specifically, 59.4% of participants reported that external factors affected their use of technology, while 40.6% cited internal factors. Among the external factors, ICT facilities, learners' readiness, and preparation time were the most commonly mentioned as influencing technology use in the classroom. Other significant external factors included workload, teaching content, and age, listed in decreasing order of importance. Regarding internal factors, teachers' skills, interests, and confidence were the most frequently cited as influencing their use of tablets. The least significant internal factor reported was teachers' beliefs or willingness to use tablets in the classroom. These findings suggest that while internal factors such as teachers' skills and confidence are important, external factors like ICT infrastructure and time for preparation play a more substantial role in shaping teachers' use of technology in educational settings.

4.6. Qualitative Comments from Respondents
4.6.1. Teachers' Views towards the use of Tablet Computers in the Classrooms

The second method of gaining a deeper understanding of the effects of using tablet computers on the attitudes of teachers towards using tablet computers in classes was through open-ended questions. Two common patterns were observed in teachers' responses to these questions:

Tablet computers appeared to be successful in creating lessons that increase the learning motivation of students, but using tablet computers seemed to make preparing for classes more time-consuming.

Participants provided their own freeform answers as their views on the use of tablet computers in teaching during the face-to-face interviews. A majority of the participants (70.3%, n=45) agreed that using tablet computers made their teaching easier. One respondent emphasized this point, particularly in relation to teaching English, stating:

"Using tablet computer makes my teaching very easier, especially in my subject (English). I get to show learners videos and images."… T16.

In addition, 59.4% of the participants agreed that the use of tablet computers enhances learners' critical thinking. One respondent highlighted the positive impact of tablets on both teaching and learning, stating:

"Tablet computers work easier for teachers and learners. It enhances critical thinking and helps students to be actively involved in learning and I have come to think that tablets are useful for getting students' attention." … T21.

These responses reflect the teachers' recognition of the benefits of tablet computers in fostering easier teaching and promoting critical thinking among students.

However, teachers' comments made it clear that using tablet computers was burdensome for those who had little experience with these devices. One respondent narrated:

"I couldn't type well with the tablet. It took time to create my presentation….T3.

4.6.2. Matters Considered as a Problem from Teachers' Point of View

Teachers' responses highlighted several problematic issues arising from the use of tablets in classrooms. The most frequently mentioned issues are presented in Figure 2.
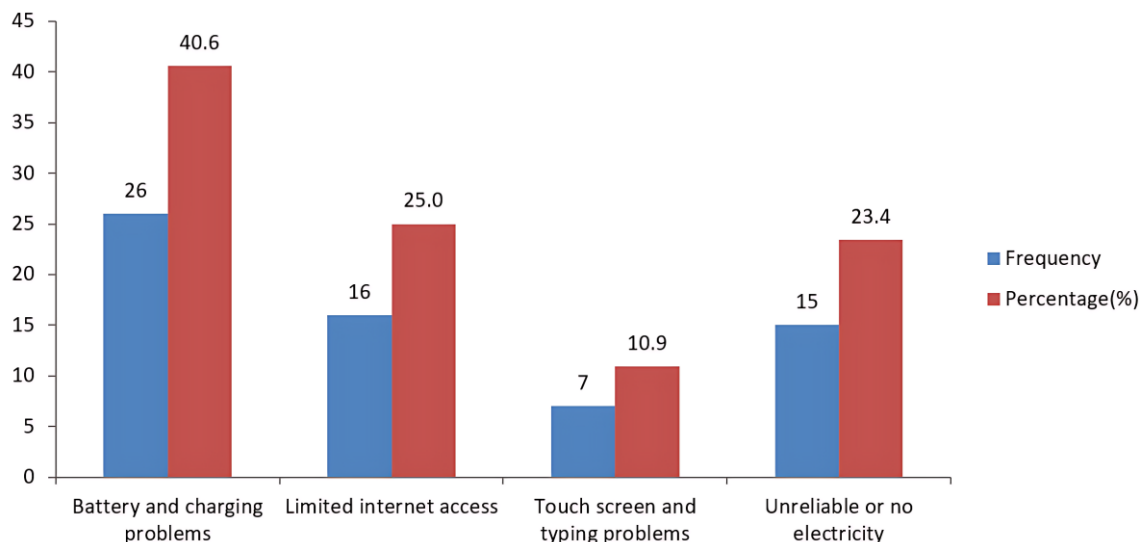

Figure 2. Problematic issues arising from the use of tablets in classrooms.

Expanding on these challenges, one respondent shared:

"The battery and charging system is a very serious problem especially for the PRITOM type…" …T28

In addition to these technical issues, teachers expressed the need for more access to tablet computers to practice creating learning activities and to foster a supportive learning environment. One teacher commented:

"Many teachers are still unfamiliar with the management of tablets, even if they have the device themselves. For example, even those with devices don't necessarily have familiarity with educational apps." … T15

Another respondent highlighted the issue of connectivity:

"Unavailability of communication mediums such as Wi-Fi makes it difficult to use it to connect to the internet." … T17.

Additionally, some respondents raised concerns about the potential for tablets to be distracting:

"Tablets are distracting……Mmmh you know, tablets could potentially be a distraction as they are associated more with entertainment than education." …. T24.

These responses highlighted by respondents suggest that while tablets offer significant benefits, there are still substantial challenges related to their use in classrooms, particularly in terms of technical issues, access to resources, and potential distractions.

4.7. Teachers' Recommendations on the Effective use of Tablets Computers

Teachers' responses revealed a strong belief that the effectiveness of tablet use in classrooms could be significantly improved by addressing gaps in knowledge and providing adequate training. The key points highlighted by the teachers include:

Inadequate information on tablet use: 76.6% (f = 49) of the teachers believed that providing clear and appropriate information on how, when, and where to use tablets would enhance their effectiveness in teaching.

Need for training: 65.6% (f = 42) of the teachers emphasized the importance of training teachers in the use of tablet computers to ensure they are equipped with the necessary skills to integrate technology effectively into their teaching practices. Use of mobile devices in schools, teachers should be trained on how to use mobile technology in education and the school system should be mobile-friendly. Use of mobile technology should be integrated into the learning process. There is no turning back, since mobile technologies are here to stay and they have to be part of the delivery mix (Philip, 2017).

These responses suggest that teachers see significant potential in tablet use for enhancing teaching and learning but feel that a lack of proper guidance, training, and functionality limits the full potential of the technology. Addressing these issues could lead to more effective integration of tablets in the classroom.

5. Discussions

This study aimed to assess primary school teachers' perceptions of using tablet computers in classrooms. The findings revealed that most teachers found tablets user-friendly, reporting that they could quickly learn to operate them, develop proficiency through practice, and retain their skills for classroom use. These results align with other research indicating that when technology is perceived as easy to use, individuals are more inclined to adopt it in their practices (Molobi et al., 2020; Mulet, Van De Leemput, & Amadieu, 2019; Peng & Hwang, 2021).

Despite these positive perceptions, the study noted that many teachers did not effectively utilize tablets in their teaching. This observation echoes Lindsey (2011) findings, which showed that only 37% of teachers used tablets in their classrooms. The gap between perceived ease of use and actual application suggests that external barriers, such as insufficient training and limited resources, may hinder effective usage.

In terms of perceived usefulness, teachers recognized that tablets could save time in their daily teaching activities, aligning with studies showing that technology integration can improve efficiency and performance (Arora & Arora, 2021; Zou, Yan, & Li, 2018). However, some research Cabero-Almenara et al. (2021) cautions that perceived usefulness does not always correlate with enhanced job performance, particularly if users feel the technology does not significantly impact their tasks.

The study also examined teachers' attitudes toward tablet use, finding that positive attitudes enhanced their teaching experience. Teachers reported enjoying their work more and feeling more engaged when using tablets, consistent with findings that positive attitudes toward technology can make teaching more enjoyable and effective (Salifu, Arthur, Arkorful, Abam Nortey, & Solomon Osei-Yaw, 2024). These attitudes were associated with increased enthusiasm and motivation to incorporate technology into their teaching practices.

However, several challenges were identified. A significant issue was the lack of training on how to use tablets effectively for educational purposes. Teachers also highlighted the misuse of tablets for non-educational activities, such as gaming or watching videos, which disrupted the classroom environment and reduced student engagement. These challenges align with findings by Çetinkaya and Keser (2014) who noted similar issues, including time wastage and diminished interest in traditional learning materials.

The study underscored the importance of equipping teachers with adequate training and knowledge to maximize the benefits of tablet use in classrooms. As technology continues to advance, teachers need to become proficient in using tablets and integrating them into their teaching practices. Previous research suggests that the proper use of tablets can significantly enhance student success rates (Çetinkaya & Keser, 2014).

In summary, while teachers generally hold positive perceptions of tablet use in classrooms, challenges such as inadequate training, misuse, and technical barriers must be addressed to ensure their effective integration into teaching.

6. Conclusion

With computer technology developing rapidly in the 21st century, the importance of providing adequate training for teachers in the effective use of tablets for teaching cannot be overstated. While teachers in this study indicated that they did not receive formal training and instead explored tablets on their own, this highlights a significant gap in professional development. Despite the widespread use of mobile devices like smartphones, it is crucial to recognize that not all teachers possess the necessary skills to use tablets effectively in educational settings without proper guidance.

In the author's view, the Ministry of Education, Science, and Technology (MoEST) should take proactive steps to identify teachers who have not received training and provide them with the necessary resources and support to integrate tablets into their teaching practices. This would ensure that teachers are equipped with the skills to fully utilize the potential of tablets, enhancing the learning experience for students.

The integration of digital technology in education is not only crucial for enhancing knowledge and skills but also plays a vital role in fostering economic growth and social equity. By improving access to educational resources and providing opportunities for skill development, digital technology can contribute to creating new employment opportunities and bridging educational gaps, ultimately benefiting society as a whole.

7. Recommendations Based on the Study Findings

Based on the findings of this study, the following recommendations have been made:
1. The Ministry of Education, Science, and Technology (MoEST) should organize training sessions or workshops to help teachers reflect on and enhance their ability to use tablets effectively for teaching.
2. Teachers should undergo formal training to improve their skills in using tablets in the classroom. Professional development programs and workshops will help them explore the full potential of tablets as educational tools, facilitating seamless integration of technology into their teaching. Additionally,

creating opportunities for teachers to reflect on their experiences with tablets will allow them to address challenges and exchange best practices.

3. MoEST should integrate technology-enhanced materials into the curriculum. To optimize the advantages of tablet, use in education, the curriculum should include technology-based resources such as digital textbooks, interactive learning tools, and educational apps aligned with the curriculum. These materials will enable teachers to engage students more effectively and foster dynamic, technology-rich learning environments.

7.1. Implications for Further Research

The key takeaway from this study is the need for teachers to continually develop their knowledge and skills in utilizing tablets within the classroom. This can be achieved through ongoing training and support, improving school infrastructure, and equipping schools with the resources necessary for effective tablet integration. Regular professional development will enable teachers to enhance their proficiency with tablets and other digital tools, maximizing the potential of technology to improve teaching and learning. Additionally, further research is essential to evaluate the academic performance of students before and after tablet implementation in Tanzanian primary schools. Such research could provide valuable insights into the impact of tablets on student learning and help determine whether their integration leads to better academic outcomes. Understanding the long-term effects of tablet use on student performance will be vital for shaping future educational policies and strategies.

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