What Drives Effective Tablet Use in Education? A Study of Teaching and Learning Practices in Singida Municipality, in Tanzania

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Abstract

The use of Information and Communication Technology (ICT) in education has become a global strategy for transformation, particularly through mobile devices like tablets, which are being used to enhance both teaching and learning. In Tanzania, this effort has been supported by government initiatives such as the Secondary Education Quality Improvement Program (SEQUIP), which targets the enhancement of education in public secondary schools. Despite substantial investment, there remains a lack of comprehensive data on the impact of tablet use on teaching, particularly in settings with limited resources. This study evaluated how effectively mobile tablets are being utilised to improve teaching methods among public secondary school teachers in Singida Municipality, Tanzania. It specifically explored how tablet usage affects teacher engagement, professional development, technological and pedagogical knowledge, and collaborative teaching strategies. The research used a cross-sectional mixed-methods approach, involving 60 teachers selected through cluster and stratified random sampling. Data were gathered using semi-structured interviews, classroom observations, and document analysis. Principal Component Analysis (PCA) was applied to create a tablet effectiveness index, and both univariate and multivariate regression analyses were used to determine key influencing factors. Results showed that effective tablet use was strongly linked to increased teacher motivation and engagement (Adjusted Coefficient: 0.7, 95% CI: 0.47–0.90), as well as more frequent tablet use in everyday teaching (Adjusted Coefficient: 0.4, 95% CI: 0.26–0.55). Although age and educational background had significant effects in simpler analyses, they were not impactful in more complex models. Teachers' comfort with technology and ability to troubleshoot also contributed positively, though less strongly. The research highlights the need for focused teacher training, better technical support, and supportive policies to encourage collaboration in teaching. These findings are valuable for decision-makers and education professionals seeking to enhance the use of digital technology in Tanzanian schools and contribute to the growing body of research on ICT in education in developing regions. The study recommends the establishment of a

structured and continuous professional development program that integrates both technical training on tablet use and collaborative teaching strategies, ensuring teachers are equipped, motivated, and supported to effectively incorporate tablets into innovative and interactive classroom practices.

Keywords: *ICT in education, digital learning, TPACK, self-determination theory, teacher collaboration, digital pedagogy.*

Introduction

The integration of Information and Communication Technology (ICT) in education has gained global momentum as a tool to enhance teaching and learning processes (UNESCO, 2023; Voogt et al., 2015). Mobile tablets, in particular, have been widely adopted to improve access to digital learning resources, increase student engagement, and promote innovative pedagogical practices (Aspiranti & Larwin, 2021; Major et al., 2021). Mobile tablets are portable touchscreen devices that support internet connectivity and educational functions, such as document processing and app usage (Sung et al., 2016). In this study, Android tablets provided by the government to teachers aim to improve teaching through affordable and user-friendly technology that supports various learning applications.

In many parts of Latin America, Europe, and Asia, governments and non-governmental organisations have initiated large-scale tablet programs with varying degrees of success, revealing that contextual adaptation and teacher readiness are key to achieving educational goals (Major et al., 2017). Across Africa, the value of digital learning tools is gaining increasing recognition, especially in regions with limited resources. Tablets, in particular, are proving useful in addressing shortages in textbooks and teaching staff. In Tanzania, the government has made ICT integration a key part of its education reform agenda. Policies like the Education Sector Development Plan (2016–2021), the 2018 National ICT Policy, and the Digital Tanzania Project underscore the push toward digital transformation in education. Through programmes such as the Secondary Education Quality Improvement Program (SEQUIP), tablets have been distributed to public secondary schools to boost educational quality and outcomes.

Singida Municipality is one of the areas that received tablets as part of this initiative between 2022 and 2023. These programs typically include both tablet distribution and teacher training. This study focuses on how such

initiatives are being implemented in public secondary schools, aiming to improve teaching quality and expand access to learning materials.

Initial feedback from schools suggests better classroom teaching, increased student engagement, and improved performance in NECTA exams. However, there is limited concrete evidence on how effectively tablets are improving teaching practices, supporting professional development, or fostering collaboration among educators. Therefore, this study specifically aimed to investigate how tablets influence teacher participation and professional growth. Examine the importance of technological and pedagogical expertise in using tablets effectively, and analyse the impact of collaboration among teachers on tablet use and teaching quality.

Problem Statement

Despite notable investments in Information and Communication Technology (ICT) and teacher support, effective use of tablets in Tanzanian classrooms remains a significant challenge. Tanzania's government implements policies such as the Education Sector Development Plan (2016–2021), the 2018 National ICT Policy, and the Digital Tanzania Project. These policies have a focus on pushing digital transformation in education by making ICT integration a key part of its education reform agenda. Through programmes such as the Secondary Education Quality Improvement Program (SEQUIP), tablets have been distributed to public secondary schools to boost educational quality and outcomes.

While research consistently highlights the potential of tablets to revolutionise teaching and learning through enhanced student engagement, motivation, and academic performance (Milman et al., 2015; Wilson & Friedrich, 2013), there is a critical gap in empirical evidence definitively supporting these claims within the specific context of secondary education in low-resource settings like Singida Municipal.

Existing research on tablet integration in education largely focuses on wealthier countries with robust educational infrastructures, often overlooking the unique difficulties faced in regions like Tanzania. Studies indicate that many Tanzanian educators struggle with tablet utilisation due to limited digital skills, a lack of relevant training, and insufficient institutional support (e.g., inadequate internet connectivity, technical assistance, and access to quality educational content) (Manyengo, 2021; ILO, 2024). Furthermore, while a 2024 study on primary school teachers in Tanzania by Prosper and Nderego (2024), found a moderate level of competence and identified

challenges in incorporating tablets, it also highlighted opportunities for innovative teaching and professional growth. However, there remains a dearth of research specifically addressing the nuanced impact of these initiatives on secondary school teachers in low-resource environments, particularly concerning their pedagogical practices, technological skills, and the potential for professional isolation or collaboration.

Therefore, there is a clear and pressing need for local research to understand the personal, institutional, and technical factors that truly affect tablet use in Tanzanian public secondary schools. Thus, this study aims to bridge this existing knowledge gap by exploring the effectiveness of mobile tablet initiatives in public secondary schools in Singida Municipality. The study delves into how tablets have specifically impacted teacher practices, teacher experiences, and overall learning outcomes, while also examining the challenges and opportunities associated with their integration.

Theoretical Framework

Self-Determination Theory (SDT)

Developed by Ryan and Deci in 2018, SDT focuses on three core psychological needs that drive motivation: autonomy, competence, and relatedness. In the context of educational technology, tablets can help teachers gain more autonomy in planning lessons, build their competence through training, and foster collaboration that enhances their sense of community. These elements collectively boost teacher motivation and support professional development, making SDT a fitting framework for assessing the impact of tablet initiatives on teaching practices.

Empirical Literature Review

Perceived Impacts of Mobile Tablets on Teacher Engagement and Professional Development

Studies show that mobile devices (tablets) enhance teacher engagement and teaching practices by fostering interactive, student-centred learning (Chang &Chang, 2021)**.** Tablets support collaborative problem-solving, multimedia-rich presentations, and flexible instruction (Choi et al., 2018; Herodotou & Muirhead, Aristeidou, Hole, J., Kelley, ., Scanlon, ., & Duffy, 2018)**.** Research suggests that tablets positively influence teacher efficacy and confidence when integrated with professional development(García-Rico et al., 2021; Zhu et al., 2020)**.** Furthermore, tablets encourage the adoption of innovative teaching methods, thus enhancing student learning.

Technological Skills and Pedagogical Knowledge for Effective Tablet Use

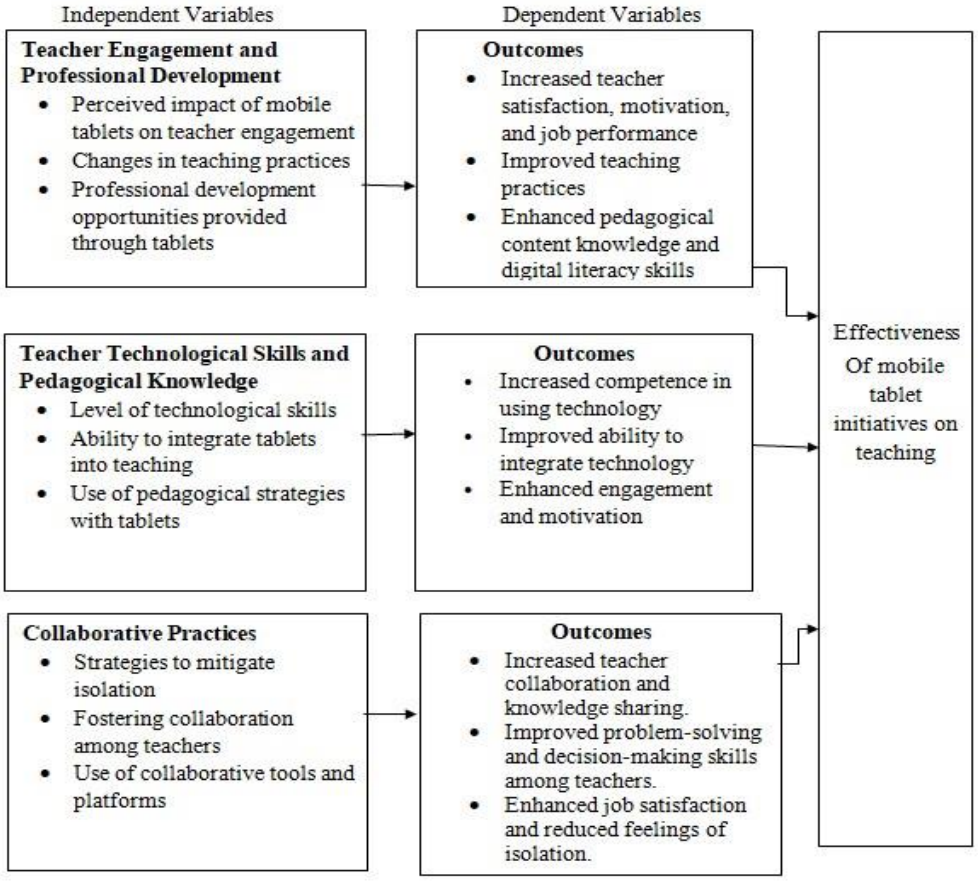
One of the key challenges in mobile device integration is teachers' limited digital skills, which can be addressed through frameworks like Technological Pedagogical Content Knowledge (TPACK) (Koehler et al., 2013). The effective mobile (tablet) use requires both technical and pedagogical training(Kim et al., 2021). Several research studies suggest that continuous professional development is essential for teachers to fully leverage tablets in the classroom(Mishra & Koehler, 2006a; Tschannen-Moran & McMaster, 2009).

Strategies to Foster Teacher Collaboration

The use of mobile devices like tablets facilitates collaborative teaching practices by offering cloud-based platforms that support resource sharing, joint lesson planning, and real-time communication. A study by Carpenter and Munshower (2020) highlights how such technologies promote the development of collaborative learning environments, enhancing engagement and interaction among educators. Similarly, Xu et al. (2020) and a study by He et al. (2020) emphasise the role of tablets in fostering virtual professional learning communities, where teachers connect remotely to exchange best practices and co-develop instructional strategies. Studies by Fisher et al. (2013) further demonstrate how tablets like iPads enable shared digital workspaces, enhancing group-based instructional models. These tools not only reduce teacher isolation but also contribute to improved teaching effectiveness through ongoing professional collaboration (Carpenter & Munshower, 2020).

Conceptual Framework

The study adopts a conceptual framework that focuses on three key factors influencing the effectiveness of mobile tablet initiatives: teacher engagement and professional development, teacher technological skills and pedagogical knowledge, and collaborative practices. These factors impact the integration of technology into teaching and the promotion of collaborative teaching models.



Methodology

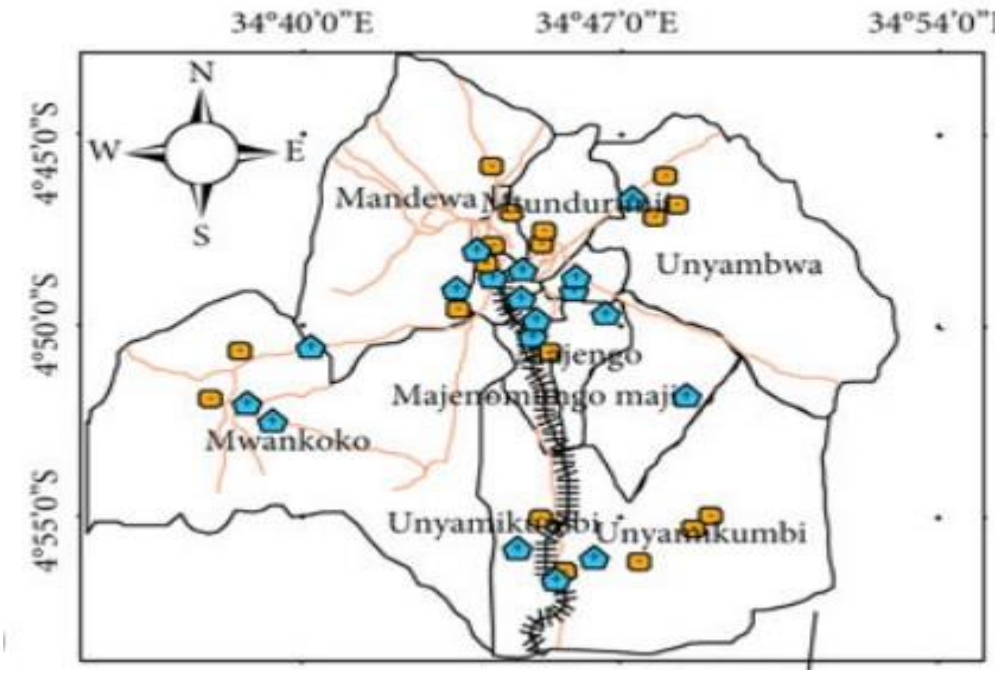
Research Design

This study employed a cross-sectional design, collecting data at a single point in time. This approach was selected due to its suitability for meeting the study's objectives within the constraints of time and resources.

Study Area

The research was conducted in Singida Municipality, Tanzania (Fig. 1). The study area was selected because it is one of the early beneficiaries of the national initiative to distribute mobile tablets to secondary school teachers. The area was purposefully selected to capture early experiences and challenges related to integrating mobile tablets into teaching practices.

Figure 1: Map of Singida Municipality



Source: The Singida Municipal Council Website (https://singidamc.go.tz/)

Singida Municipal, an urban hub with a diverse population, is strategically located and undergoing socioeconomic transformation, making it a suitable setting for exploring educational technology initiatives.

Sampling and sample size

The study targeted public secondary school teachers in Singida Municipality. Out of a total population of 415 teachers across 20 public secondary schools, a sample of 60 respondents was determined using Slovin's formula to ensure representativeness while accounting for the available resources. A two-stage sampling technique was employed. In the first stage, cluster sampling was used to group the schools and randomly select a subset of them. In the second stage, stratified random sampling was conducted to select teachers from the chosen schools, ensuring proportional representation based on their positions within the schools.

Data Collection Methods

A mixed-methods approach was employed to ensure comprehensive data collection, integrating both qualitative and quantitative strategies. Primary data were collected through semi-structured interviews. These interviews explored in depth the integration of technology into teaching, associated challenges, training received, and perceived pedagogical impacts.

Furthermore, classroom observations were carried out to directly assess how mobile tablets were utilised in daily teaching practices and how their use influenced student engagement and learning outcomes. Secondary data were sourced from school reports, policy documents, and relevant literature, including studies on educational technology implementation in similar contexts.

Variables and Measurement

Outcome (Dependent) Variable

The outcome variable is "Effectiveness of Mobile Tablets in Enhancing Teaching and Learning." This is an index of the following variables: The extent to which the introduction of tablets increased overall motivation and engagement in teaching. The daily use of tablets in teaching practices. The impact of tablet use on the variety of teaching methods. Participation in professional development programmes on effectively utilising tablets, utilisation of mobile tablets to collaborate with other teachers, and the feeling that your current pedagogical knowledge and skills equipped you to integrate tablets. The index was constructed using principal component analysis and left on a linear scale.

Table 1. Predictors (Independent) Variables

Domain	Variables
Demographics	Sex, Age, Marital Status, Education level
Tablet Usage	How often do you use tablets in teaching, and do you integrate tablets into lesson plans
Tech Skills	Rate your comfort level with using the basic function of the mobile tablet, and how confident were you in troubleshooting minor technical difficulties?
Collaboration & Isolation	Do you utilise mobile tablets to collaborate with other teachers? How effective are the existing structures in facilitating collaboration and knowledge sharing? Do you feel comfortable reaching out to colleagues for help or advice on using mobile tablets for teaching? How had mobile tablets impacted your ability to collaborate on lesson planning and curriculum development?
Teaching Innovation	Has the use of tablets impacted the variety of teaching methods? (Qn8), Used tablets for lesson planning?

Data Analysis

Stata software was utilised for data analysis. The process began with descriptive statistics to outline the demographic and contextual profiles of the participants. Next, univariate logistic regression was used to explore the relationship between each independent variable and the outcome of the effectiveness of mobile tablets in enhancing teaching and learning. Variables that showed statistical significance in the univariate analysis were further

assessed using multivariate logistic regression to identify key predictors while accounting for possible confounding factors. Visual tools like charts and graphs were employed to present the results in an easily understandable format.

Validity and Reliability: To verify construct validity, the Variance Inflation Factor (VIF) was used to detect multicollinearity, especially among predictors that contributed to the outcome variable.
Reliability was reinforced through the use of standardised instruments and preliminary pilot testing.

Ethical Considerations

The researcher complied with established ethical guidelines. Participants gave informed consent after being fully briefed on the study's purpose and their rights. Ethical approval was secured from the Open University. Measures were taken to safeguard data confidentiality and ensure participant anonymity, with access restricted to authorised individuals. Throughout the study, participants were treated with respect and integrity.

RESULTS

Descriptive statistics

The study involved 60 respondents, with a majority being male (60%) and females comprising 40%. Most participants were aged between 31 and 40 years (41.7%), followed by those aged 21 to 30 years (38.3%), and a smaller portion aged above 41 years (20%). In terms of marital status, 51.7% were married, 41.7% single, and 6.7% divorced or widowed, as shown in Table 2.

Table 2: Background statistics

Variable	Frequency	Percent
Sex of Respondent		
Female	24	40.0
Male	36	60.0
Age of Respondent		
21 - 30 yrs	23	38.3
31 - 40 yrs	25	41.7
41+ yrs	12	20.0
Marital Status		
Single	25	41.7
Married	31	51.7
Divorced / Widow	4	6.7
Years of experience		
Less 5 yrs	17	28.3
5 - 10 yrs	25	41.7
10+ yrs	18	30.0
Education level		
Certificate	1	1.7
Diploma	14	23.3
Bachelor	40	66.7
Masters	5	8.3
Current position		
Ordinary Teacher	22	36.7
Classroom Teacher	22	36.7
Academic Teacher	9	15.0
Discipline Teacher	5	8.3
School Head Teacher	2	3.3
Total	**60**	**100.0**

Regarding teaching experience, the largest group had between 5 and 10 years of experience (41.7%), followed by those with over 10 years (30%), and the least had less than 5 years (28.3%). Educationally, the majority held a Bachelor's degree (66.7%), with fewer having Diplomas (23.3%), Master's degrees (8.3%), and only one with a Certificate (1.7%). Participants held various positions, with ordinary and classroom teachers each representing 36.7% of the sample, followed by academic teachers (15%), discipline teachers (8.3%), and head teachers (3.3%).

Collaborative Practices

The impact of mobile tablets on collaboration in lesson planning and curriculum development revealed varied outcomes among teachers, as in Table 3. While a notable 40% of teachers reported a general increase in collaborative activities, the perceived effectiveness of existing school structures in facilitating this collaboration was mixed. Only 13.75% rated the existing structures as "very effective", and 32.50% found them "effective." Conversely, a significant portion, 40.00%, perceived these structures as only "moderate," while 12.50% found them "ineffective" and 1.25% considered them "very ineffective". These findings suggest that while mobile tablets hold potential for fostering teamwork and curriculum development, there is a clear need for additional support and training to ensure that all teachers can effectively leverage these devices for collaborative practices.

Table 3: Collaborative Practices

Institutional Collaboration	Responses	Frequency	%
Discussion of experiences and challenges using mobile tablets with other teachers			
Always	Always	8	13.75
Often	Often	28	46.25
Rarely	Rarely	20	33.75
Never	Never	4	6.25
Total	Total	60	100.00
Summary of collaborative structures			
Formal Structures	Formal Structures	2	13.33
Online Communication Platforms	Online Communication Platforms	6	40.00
Academic Groups	Academic Groups	3	20.00
Support for Infrastructure	Support for Infrastructure	4	26.66
Total	Total	15	100.00
Effectiveness of existing structures at school in facilitating collaboration and knowledge sharing about using mobile tablets for teaching			
Very effective	Very effective	8	13.75
Effective	Effective	20	32.50
Moderate	Moderate	24	40.00
Ineffective	Ineffective	7	12.50
Very ineffective	Very ineffective	1	1.25
Total	Total	60	100.00

Bivariate Analysis

The bivariate analysis indicates that a number of variables are linked to higher levels of effective tablet use. Although males had scores that were 0.4 points higher than females, this difference wasn't statistically significant. Additionally, age showed a negative correlation with effective tablet use (Coefficient: -0.8, 95% CI: -1.3 to -0.5), suggesting that younger teachers generally achieve better scores. Education level was positively associated

(Coeff: 1.2, 95% CI: 0.5 to 2.0), suggesting that higher education correlates with better tablet use; see Table 4.

Table 4: Bivariate and Multivariate Regression for predictors of effective tablet usage

Variable	Coeff [95% CI]	Adj. Coeff [95% CI]
Sex of respondent		
Female	Reference	
Male	0.4 [-0.6 - 1.3]	0.1 [-0.13 - 0.33]
Age of respondent	-0.8 [-1.3 - -0.5] *	-0.1 [-0.38 - 0.20]
Education level	1.2 [0.5 - 2.0] **	-0.2 [-0.45 - 0.01]
Extent of increase of Motivation & Engagement	1.9 [1.6 - 2.3] ***	0.7 [0.47 - 0.90] ***
The frequency of tablet usage in daily teaching practices	1.2 [1.0 - 1.5] ***	0.4 [0.26 - 0.55] ***
Do you integrate tablets in lesson plans?		
No	Reference	
Yes	2.2 [1.5 - 3.0] ***	0.1 [-0.25 - 0.47]
Level of comfort using mobile tablet	1.5 [1.1 - 1.9] ***	0.2 [-0.10 - 0.41]
Level of confident to troubleshoot minor technical difficulties	1.1 [0.8 - 1.5] ***	0.2 [-0.01 - 0.33]
Do you utilize mobile tablets to collaborate with other teachers		
No	Reference	
Yes	2.4 [1.7 - 3.2] ***	0.7 [0.37 - 1.02] ***
Level of effectiveness in facilitating collaboration & Knowledge sharing	0.9 [0.5 - 1.4] ***	0.01 [-0.13 - 0.16]
Ability level to collaborate on lesson planning	1.6 [1.1 - 2.1] ***	0.07 [-0.18 - 0.32]
Level of comfortability reaching out colleagues for help or advice	1.3 [0.9 - 1.7] ***	0.07 [-0.16 - 0.30]
Level of Improved varied of teaching methods	1.6 [1.3 - 2.0] ***	0.7 [0.49 - 0.83] ***
Using tablets for lesson planning		
No	Reference	
Yes	1.8 [0.9 - 2.6] ***	0.1 [-0.17 - 0.44]

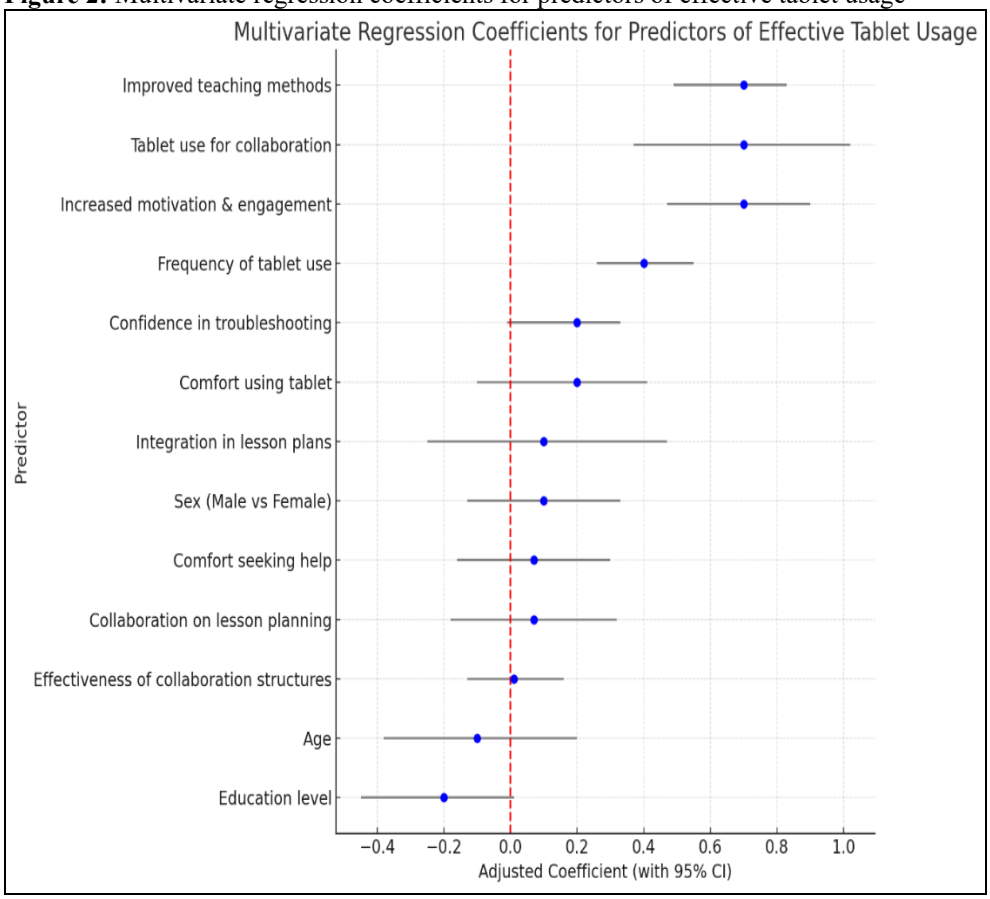
Increased motivation and engagement had a strong positive effect (Coeff: 1.9, 95% CI: 1.6 to 2.3), as did the frequency of tablet use in daily teaching (Coeff: 1.2, 95% CI: 1.0 to 1.5). Teachers who integrated tablets into lesson plans scored significantly higher (Coeff: 2.2, 95% CI: 1.5 to 3.0), and those comfortable using devices and troubleshooting technical issues also scored higher (Coeffs: 1.5 and 1.1, respectively), Table 3. Collaboration aspects were also significant: using tablets to collaborate, facilitating collaboration and knowledge sharing, and collaborating on lesson planning all had significant positive associations. Lastly, there was a significant correlation between improving teaching methods and using tablets for lesson planning and higher scores.

The finding shows that simply possessing the tablets, or even a teacher's age or educational background, were not the most significant independent factors. Instead, the active engagement and practical application of tablets emerged as the key drivers.
Teacher motivation and frequent use were found to be crucial. A one-unit increase in a teacher's motivation and engagement was linked to a notable 0.7-point increase in tablet effectiveness. Similarly, a one-unit increase in how frequently teachers used tablets in daily teaching led to a 0.4-point increase in effectiveness. This highlights that if teachers are enthusiastic and consistently integrate tablets into their daily lessons, they become considerably more proficient and impactful with the technology.

Beyond individual use, collaboration among teachers and the ability to diversify teaching methods with tablets also significantly boosted their effectiveness. Teachers who actively used tablets to collaborate with colleagues had their effectiveness increased by 0.7 points compared to those who didn't. Likewise, a one-unit improvement in the variety of teaching methods due to tablet use was associated with another 0.7-point increase in effectiveness. This indicates that tablets are most beneficial when they foster teamwork and encourage teachers to explore new, creative pedagogical approaches.

Multivariate Analysis
In the multivariate model, after adjusting for all other factors, only a few variables remained significantly associated with effective tablet usage. Sex, age, and education level lost significance, indicating that their initial effects were likely confounded by other variables.

Figure 2: Multivariate regression coefficients for predictors of effective tablet usage



The extent of increased motivation and engagement remained a strong predictor (Adj. Coeff: 0.7, 95% CI: 0.47 to 0.90), as did the frequency of tablet use in daily teaching (Adj. Coeff: 0.4, 95% CI: 0.26 to 0.55). Using tablets for collaboration with other teachers also remained significant (Adj. Coeff: 0.7, 95% CI: 0.37 to 1.02). Likewise, improved variety in teaching methods stood out as a robust predictor (Adj. Coeff: 0.7, 95% CI: 0.49 to 0.83). Other factors, including comfort and confidence in using tablets or integrating them into lesson plans, were not statistically significant in the adjusted model; see Figure 2.

Discussion

This study explored the effectiveness of mobile tablets in enhancing teaching and learning among public secondary school teachers in Singida Municipality. The analysis uncovered valuable insights into how contextual elements affect the successful use of tablets in rural educational environments.

Demographic Characteristics and the Effectiveness of Tablet Use

The descriptive statistics indicated that the teaching workforce was generally young and fairly experienced, with most educators between the ages of 31 and 40 and possessing 5 to 10 years of teaching experience. Initial bivariate analysis showed that younger teachers and those with higher educational qualifications tended to use tablets more effectively. However, these links were not significant in the multivariate analysis. This implies that while demographic factors may shape early perceptions or abilities, their influence weakens when actual usage behaviours and the surrounding context are considered. These results are consistent with the findings of Sung et al. (2016), who concluded in a meta-analysis that once pedagogical strategies and integration of technology are accounted for, age and gender have minimal direct impact on digital learning outcomes.

Motivation, Frequency of Use, and Teaching Integration

Effective use of tablets in classrooms is largely influenced by teachers' motivation and behaviour. Teachers who felt more motivated and engaged when using tablets achieved better outcomes. Regular use of tablets in daily teaching also strongly correlated with success. These patterns support Chang's (2022) review, which stressed that sustained motivation and routine use of mobile devices are essential for meaningful educational results. Although integrating tablets into lesson plans initially seemed important, it lost impact in a more detailed analysis, implying that actual usage and enthusiasm are more crucial than planning alone. This finding is supported by Ertmer et al. (2012), who emphasised that effective digital integration depends more on teachers' continued involvement than on curriculum alignment. These insights are consistent with meta-analyses like that of Sung et al. (2016), which found that mobile technology enhances learning when paired with strong pedagogy and collaborative activities.

Collaboration and Changes in Teaching Practices

Collaboration among peers was a key factor in successful tablet use. Teachers who used tablets to collaborate or to share knowledge reported better outcomes. Obonyo (2023) similarly found that digital tools enhance teaching through collaborative practices. Additionally, the use of tablets was associated with a wider variety of teaching strategies, suggesting that these devices can foster more innovative and student-focused approaches. Teachers who diversified their teaching methods using tablets scored higher, supporting findings from Kim et al. (2020) and Yakar et al. (2020), which showed mobile technologies promote active, constructivist learning. Hwang

and Tsai (2011) also reminded us that it takes thoughtful planning and preparation to optimise mobile learning.

Conclusion

This research examined how mobile tablet programs affect teaching practices and teacher experiences in Singida Municipality's public secondary schools. It is found that higher motivation, more frequent use, greater teaching variety, and collaborative practices were key to effective tablet use. Although demographic factors like age or education had some influence at first, they became less important when practical teaching practices were considered, highlighting the central role of active tablet integration over background characteristics.

Study Implications

i) Effective use of tablets can significantly increase teacher motivation and engagement, and this can lead to more innovative teaching methods and enriching student learning experiences.
ii) Specialised and ongoing professional development for teachers is essential to improve teachers' tech skills and teaching expertise, and by doing so, it maximises the benefits of digital tools in the classroom.
iii) Encouraging and promoting collaborative teaching practices through tablets leads to better instructional interactions and a supportive educator community, and improves teaching outcomes.
iv) A need to address infrastructure challenges calls for policymakers to ensure the availability of adequate resources and support systems, including technical assistance, to overcome barriers to effective tablet integration in education

Recommendations

To enhance the usage of technology like tablets in education, policymakers should promote their regular integration into daily teaching to build confidence and effectiveness. Professional development must focus on boosting motivation and engagement through interactive methods. Encouraging teacher collaboration via tablets is key, as it strongly predicts effective use of technology in teaching. Continuous training and technical support, including peer mentoring, are essential. Expanding research beyond Singida will help validate findings across different contexts.

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Conflict of Interest
The authors declare no conflict of interest or ethical concerns

Authors' contributions
Mallya Stephen designed the study, contributed to data collection, and drafted the manuscript. Harrieth Mtae performed the analysis, supervised the manuscript and wrote the discussion, conclusion, and recommendations.

Data Availability Statement
Additional information, such as data used for analysis, can be obtained by sending an email request to the corresponding author.

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