Exploring ICT Integration in Teaching Practices at Vikenge Primary School in Tanzania: Challenges and Opportunities

Mercy Mlay Komba[1]

[1]mmkomba@gmail.com

[1]https://orcid.org/0009-0005-6957-9334

[1]Mzumbe University, Morogoro, Tanzania

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ABSTRACT

This paper focuses on how Information and Communications Technology (ICT) has been implemented in Vikenge Primary School in Tanzania with a view of ascertaining the current practice, areas of concern and possibilities for change. The study adopted a case study research approach. Purposeful sample of 11 teachers was interviewed for a deeper understanding of ICT integration. Data was obtained through lesson observation and semi structured interviews. The thematic analysis method was used to analyze the data. Outcomes demonstrated that ICT use is almost negligible now as there are no computers, no internet connection, and lack of proper training of teachers. However, the participants recognized areas that needed improvement in the future, particularly in the utilization of ICT in the effectiveness of teaching and enhancement of the learner achievements. The study suggests enhanced support for ICT facilities and services, dependable Internet connection, increased professional development in teacher education, and consistent institutional backing. The research results are expected to be useful for stakeholders and VT with the focus on improving ICT implementation in Vikenge Primary School and other similar schools.

Keywords: Digital Learning Tools, Education Technology, ICT Challenges, ICT Integration, Primary Education
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I. INTRODUCTION

Over the past 40 years, the adoption of ICT in primary education has grown to be one of the key determinants of influencing the teaching pedagogy and classroom learning (Goh & Sigala, 2020). Such global changes have revealed the capacity of ICT in improving students' educational experiences as well as creating more effective notions of teaching-learning processes (Schmidt & Tang, 2020; Haleem et al., 2022; Timotheou et al., 2023). The use of computers, tablets, and other forms of specific educational software have completely altered the traditional approach to teaching and learning method, observing that, ICT tools enhance teachers practice by availing to them modern day tools that enhance learning methods (Haleem et al., 2022). It is equally important to understand how these technologies can be implemented in the context of primary education to derive optimal benefits from such change.

Globally, Perienen (2020) and Akram et al. (2022) have discussed different aspects of ICT in education and outlined a number of factors that have significant impact on effectiveness of ICT in learning environment. Literature reviews of effective ICT integration have also noted basic components, which include the accessibility of technological tools, the adequacy of teacher education programs, and organizations' strong supportive frameworks as critical components (Perienen, 2020; Agyei, 2021; Gomez et al., 2022). In Valverde-Berrocoso et al. (2021), the authors explain that pre-service teachers have to go through an adequate preparation process in order for them embrace and implement ICT in their teaching practice and to use ICT for the development of student learning. In addition, the access to technical support and adequate infrastructures is determinant for maintaining and solving problems in ICT tools, which are essential in educational context (Timotheou et al., 2023).

Alenezi et al. (2023) highlighted that ICT integration in teaching learning process in primary schools in Tanzania has various dimensions such as: a greater student involvement, and better access to teaching and learning materials. The study on the implementation and usage of ICT in Tanzanian school identifies the factors that affect the usage of ICT in Tanzanian education sector. Some of the factors include shortcomings in educational policies, challenge with resources, challenge with online learning teaching, and challenge with instructors (Chasubuta & Ndibalema, 2024). Although there is an increasing trend in the use of ICT for education and training, several crucial challenges have been observed. Some of these barriers are: scarcity of ICT specialists, slow internet connection, limited financial resources, frequent power loss, absence of user friendly software, and challenges in system compatibility and connectivity (Mbawala et al., 2024). These challenges call out for specific improvements to ICT

resources and facilitation, intensive preparation for teachers, and practical frameworks to improve technology adoption in primary education in Tanzania.

The above socio-economic challenges exemplify the various hurdles that hamper the successful implementation of ICT in primary education. Socio-economic status is critical when it comes to the use of ICT because the level of development and resource availability determines its adoption in schools. Nonetheless, the attempts of the government to introduce ICT in education system present no hopeful signs in the search for ways to overcome the digital divide (Ndume et al., 2021). Such divergence underlines the need to address socio-economic disparities in order to foster equal chances to apply ICT facilities and prospects for all learners.

Overall, understanding opportunities and challenges for ICT integration is crucial for identifying effective strategies to enhance ICT integration in primary education. In light of this background, this study addresses the significant gap in understanding the specific barriers and opportunities related to ICT integration in Tanzanian primary schools, particularly at Vikenge Primary School. Despite the recognized potential of ICT to enhance educational outcomes, there remains limited empirical evidence on its actual implementation and the challenges faced by teachers in this context. Therefore, this study aims to examine the current level of ICT integration in teaching practices, explore the main challenges hindering effective ICT usage, and identify opportunities for improving ICT integration at Vikenge Primary School.

II. METHODOLOGY

The section below presents the study design, sampling approach, data collection and analysis procedures, and ethical considerations used to explore ICT integration at Vikenge Primary School.

2.1 Research Design

This research adopts a qualitative research technique with an emphasis on case study research design. A case study is described as a detailed analysis of an instance or a phenomenon under study in its natural environment for purposes of understanding such issues. This design is especially helpful in researching modern processes in which the distinction between the context and phenomenon is not quite clear (Schoch, 2020). This design is applicable on this study because it enables the researcher to get more information concerning the context of Vikenge Primary school and the different perspectives regarding the Implementation of ICT in teaching practices. This design helps the researcher to capture ICT use dynamism in the specific educational context taking into consideration one or many factors. In essence, by concentrating on a single case, the study seeks expected findings that may have implications for other educational practices and policies in Tanzania.

2.2 Population and Sample

This study was conducted in Vikenge Primary School which is the only government school in Vikenge village. For the purpose of sampling, no other schools could be considered since there is only one school in this ward. There are twenty-two teachers in Vikenge Primary School. From this population, purposive sampling was employed to select 11 teachers for the study. This method was adopted in order to ensure a variety of perceptions from the participants as well as relevant knowledge and experience in the use of ICT thus affording a mixture of views pertinent to the current issues concerning the use of ICT at the school.

2.3 Instruments

The research instrument that was employed in the study was the semi-structured interview plan. They allowed the use of a semi-structured interview that made it easier in asking the participants about their experiences. To promote the validity of the responses given, interviews were conducted in Kiswahili language.

2.4 Data Collection Procedures

Semi structured interviews were conducted through telephone. This way, all the participants that were chosen for the study could be involved, regardless of the schedule problems. All the participants allowed the use of audio recording and each participant was interviewed for 30-45 minutes.

2.5 Data Analysis

Thematic analysis method was used in the study to analyze data from the interviews. In line with Braun and Clarke (2019), this method of qualitative research included the pattern or thematic analysis of data. The Kiswahili data was translated for reporting purposes after translation.

III. FINDING & DISCUSSIONS

This section presents the analysis of the current state of ICT integration at Vikenge Primary School in response to the research questions that guide this study. Specifically, the research questions are: 1) How is ICT used in teaching practices at Vikenge Primary School? What are the major obstacles to successful ICT use? (2) What is done to increase the chances that ICT teaching will improve? (3) What are the opportunities for improving ICT integration in teaching?

3.1 Current Level of ICT Integration

The results revealed that ICT integration does not exist at Vikenge Primary School. Results indicate that participants have no computers and no internet access, greatly hampering their ability to integrate technology into their teaching. Participant 6 stated, "*We aren't utilizing any computers or internet, ICT is entirely impossible in our teaching.*" This conclusion is consistent with broader challenges faced by schools in such an environment characterized by lack of resources to implement ICT, for instance, Chris (2015) revealed that major barriers to ICT adoption in primary schools in Kenya were shortage of ICT infrastructure and resources.

The gap between the positive impacts of ICT and its current implementation is evident, as shown by Participant 3: "*We do not have the resources to integrate ICT; we are completely depending on traditional ways of teaching.*" In addition, participant 1 also described, *"We know that ICT could help us change the way we teach but we are just teaching the basics without the resources.*" This observation indicates that current infrastructure has problems making optimal use of ICT potential. This is in congruence with the findings by Mbawala et al. (2024) who identified inadequate ICT resources as a barrier to transforming from traditional to technology-aided teaching methods.

3.2 Challenges Hindering Effective ICT Usage

A major challenge to ICT integration at Vikenge Primary School is the non-availability of ICT resources and infrastructure. The participants identified this as one of the major barriers to including technology as a component of their teaching practices. Participant 5 opined, "*Even if we had training, it would not matter utilizing the lack of tools and connectivity.*" This comment also points to the shortcomings of professional development when there is no starting place. The vision supported is that professional development alone cannot overcome infrastructural deficits, literature on this perspective. This finding is consistent to the study carried out by Rana and Rana (2020) that documents that teachers' resistance to learn to use ICT and the lack of funding to ICT infrastructures and training (both teaching and non-teaching) were the main obstacles to successfully incorporate ICT into teacher education.

The following finding reveals the disconnection between the theoretical plans and a practical application; as stated by Participant 9 "*The absence of resources means you can have the well-organized plan to integrate ICT, but you cannot achieve it.*" This corresponds to the research that points that infrastructural limitations can prevent successful ICT implementation. For example, Kibuku et al. (2020) argued that the challenges confronting universities in Kenya to embrace e-learning are in ICT infrastructure and ever evolving technologies. There is a practical barrier to effective utilization of ICT—equipment and lack of connectivity that require a major investment in ICT infrastructure.

Participant 8 stated, "*without computers or internet, you cannot bring ICT into our lessons.*" It, however, brings to attention the main concern, which is absence of basic ICT infrastructure, which hinders current use of ICT as well as effectiveness of teaching. This expressed same result of Adarkwah (2021) which indicates that even with access to ICT resources, incorporation of ICT into Ghanaian school learning is still hindered by other factors. The students found online learning to be ineffective. While online learning is a good initiative, they prefer traditional approach over online learning which faces a lot of challenges. Similarly, Akram et al. (2022), found that teachers are prevented from exploiting technology to enhance their teaching methods by the absence of ICT resources.

3.3 Opportunities for Improving ICT Integration in Teaching

Although the usage of ICT is currently a challenging issue, the teachers of Vikenge Primary School want to improve ICT integration. Results indicate participants were optimistic about the advantages of ICT and there were many suggestions for improving ICT's use in teaching. For example, Participant 7 said: "*If they gave us computers and internet, it could greatly help our teaching. Training and support aspects are very important to facilitate the use of ICT in teaching.*" In accordance with this finding, the provision of digital skill training and exposure to new digital tools could lead teachers to use different kinds of technologies in their lessons (Agyei, 2021; Timotheou et al., 2023). This viewpoint indicates the benefit of ICT resources and professional development. To effectively integrate ICT, you need to combine resources, training as well as support.

Furthermore, participant 2 mentioned, "*With the right resources, ICT could make our lessons more interactive and engaging.*" This aligns with Qaddumi et al. (2021) who found that implementing and supporting the integration of internet services and other ICT tools such as smart boards in primary school classrooms is crucial for students, in that

it will support them in learning languages better, interacting, being more motivated, communicating effectively, e-mailing, thinking critically in schools' forums and exchanging ideas. This reflects the importance of having right ICT resources to improve teaching practices and student engagement suggesting the benefits of ICT in creating dynamic and interactive learning.

Participants also emphasized the need for improved institutional support and policy changes. Participant 4 suggested, "*The administration should focus more on ICT integration policy, as it could transform our teaching methods and improve learning outcomes.*" This aligns with the study of Akram et al. (2022) who identified the absence of predefined educational policies as a big hurdle that prevents teachers from efficiently using technology in their instructional practices. Furthermore, Akram et al. (2022) suggested that concerned authorities should set clear and effective policies to make efficient use of ICT by allocating a sufficient budget and ensuring all necessary facilitation (e.g., ICT infrastructure, tools, software, internet, and labs) in all educational institutions. Effective integration often requires not only resource allocation but also a supportive institutional setting that prioritizes technology in education.

Participant 10 proposed a phased approach to ICT implementation: "*The current challenges could be eliminated through proper planning and phased approach to ICT implementation. This is a structured planning with incremental implementation perspective*". This approach is supported by Demestichas and Daskalakis (2020), who recommend planning in educational technology in order to deal with issue relating to integration. Additionally, Weiser et al. (2020) argue that by undertaking phased implementation, it makes change and resource allocation a step-by-step process, which is more efficient and sustainable in terms of integrating technology.

Participant 11 underscored the role of community and stakeholder involvement: "*Activities such as connecting with community stakeholders and looking for external support may offer these resources and advocacies for successful ICT integration.*" Similarly, Bariu (2020) found that majority of schools in Kenya have low investment in the ICT infrastructure as a result of high cost of computer hardware, software and related accessories and recommends all necessary parties should eliminate all the challenges that hinder use of ICT in teaching and learning. From these findings, the collaborative opportunity of closing resource gaps should be explored. Mohd and Shahbodin (2021) claim that engaging with external partners can secure resources needed and support environment for ICT integration.

IV. CONCLUSIONS & RECOMMENDATIONS

4.1 Conclusions

This study reveals the current ICT integration status at Vikenge Primary School by pointing out various obstacles, which are limited ICT training, lack of ICT infrastructure, computers and internet access, which limits ability to integrate ICTs in teaching. In addition, various opportunities were expressed by teachers such as increased access to resources, targeted training and more robust institutional support. Additionally, the need for clear policies and consistent support from school administration and the government to direct the work of ICT integration was highlighted. Engaging with community stakeholders and winning external support can help to bridge the resource gap and hence support ICT based learning.

4.2 Recommendations

A strategy is needed to resolve the challenges and harness the opportunities as outlined in these findings. Therefore, it is the responsibility of the government to spend more on the ICT infrastructure and make the internet accessible at Vikenge primary school. ICT should be integrated under the clear policies of educational authorities and teacher training programs need to be developed in extensive manner to improve their skills in the best use of technology. Thus, school administrators should concentrate on creating ICT conducive environment by implementing policy, procedures and guidelines and ensuring that they continuously provide technical support for ICT use. Besides, collaboration with stakeholders from the community (parents and local businesses) can help to increase available resources and to advocate for ICTs. Through addressing these challenges and taking advantage of the opportunities that were highlighted, stakeholders' contribution will enhance the integration of ICT in teaching practices at Vikenge Primary School and shape the educational experience for the students.

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