An Investigation of Factors Affecting the Integration of Technology in the Teaching of Commercial Subjects: A Case Study of Three Selected Rural Secondary Schools in Sinazongwe District of Zambia

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ABSTRACT

The integration of technology in education has become an essential component of effective teaching and learning in the 21st century. In the teaching of commercial subjects, technology enhances learners' understanding, promotes interactive learning, and equips students with relevant digital skills for the modern business environment. However, the successful integration of technology in rural schools remains a challenge. This study investigated the factors hindering the integration of technology in the teaching of commercial subjects in three selected rural secondary schools in Sinazongwe District.

The objectives of the study were to identify the barriers affecting technology integration, examine the availability and accessibility of technological resources, assess teachers' technological competencies, and explore possible strategies for improving technology use in the teaching of commercial subjects. The study employed a descriptive case study design using both qualitative and quantitative approaches. Data were collected from commercial subject teachers, school administrators, and learners through questionnaires, interviews, and observations. The collected data were analyzed using thematic analysis for qualitative data and descriptive statistics for quantitative data.

The findings revealed that technology integration was hindered by several factors, including inadequate technological infrastructure, limited access to computers and internet connectivity, insufficient teacher training in information and communication technology (ICT), unreliable electricity supply, and inadequate funding for educational technology. The study further established that these challenges negatively affected the quality of teaching and learning of commercial subjects in the selected schools.

The study concluded that despite the recognized benefits of educational technology, significant barriers continue to limit its effective integration in rural secondary schools. It recommends increased investment in ICT infrastructure, provision of adequate technological resources, continuous professional development for teachers, and strengthened government and stakeholder support to enhance technology integration in commercial subject instruction.

Keywords: Technology Integration, Commercial Subjects, ICT in Education, Rural Secondary Schools, Teaching and Learning.

INTRODUCTION

Introduction

This chapter provides the background to the study and the statement of the problem. The chapter also contains the purpose, objectives, research questions, significance of the study, limitation and delimitation of the study. The chapter culminates with the definition of terms used in this document.

Background of the Study

The integration of technology into classroom instruction has become a defining feature of modern education systems worldwide. In contemporary pedagogical discourse, technology is widely recognized as a catalyst for improving teaching effectiveness, enhancing learner engagement, and enabling innovative instructional strategies across disciplines (Johnson, 2020). In commercial subjects such as accounting, business studies, commerce, and entrepreneurship, technology plays an especially vital role, given that the business world itself is driven by digital tools, electronic financial systems, and global information networks. Effective integration of technology into commercial subject teaching can thus prepare learners for a rapidly evolving labour market while enhancing their conceptual understanding and practical skills (UNESCO, 2021).

Globally, technological advancement has reshaped educational systems, influencing how teachers deliver content and how learners interact with instructional material. Over the last two decades, researchers and policymakers have emphasized the potential of Information and Communication Technologies (ICTs) to transform teaching and learning processes. Technology is not only viewed as a tool for supporting teaching but also as a means of promoting learner-centered approaches, fostering critical thinking, and facilitating access to digital resources (Voogt & Knezek, 2018).

In developed countries, the integration of technology into commercial subjects is well established. Digital accounting applications, financial simulations, virtual business environments, spreadsheet tools, and online research platforms are commonly embedded within instructional practice (Keller, 2020). These innovations help students develop practical business competencies and improve their familiarity with real-world commercial operations. However, in developing nations, including Zambia, the adoption of such tools has been considerably slower, particularly in rural schools where infrastructural development remains limited (Mudenda & Chigona, 2022).

The Zambian government has made several efforts to promote ICT integration in education. The Education Curriculum Framework (2013) highlights ICTs as essential tools for enhancing teaching and learning efficiency, and the *National ICT Policy* emphasizes the need for capacity-building and infrastructure expansion (MoGE, 2019). Furthermore, initiatives such as the installation of computer laboratories and the provision of computers to schools have been implemented over the past decade. Nonetheless, the impact of these policies has been inconsistent, and many schools in rural districts struggle with sustainability, maintenance, and meaningful integration of technology into classroom practices.

Commercial subjects, due to their applied nature, require tools that facilitate practical learning. Spreadsheets, accounting software, point-of-sale systems, financial calculators, and presentation tools are essential for effective teaching and learning (Sakala & Banda, 2021). When such technologies are absent or underutilized, learners are denied opportunities to develop the competencies needed for higher education and employment in the commercial sector.

Within Zambia the secondary curriculum includes commercial subjects such as Commerce, Business Studies and Principles of Accounts with syllabi that emphasise practical numeracy, business transactions, bookkeeping and entrepreneurship. While the curriculum content is conducive to technology-enhanced learning for example, using spreadsheets for accounts, simulation software for business scenarios, the translation of curricular objectives into classroom practice depends on teacher competence, access to devices and relevant digital learning resources. Available studies from Zambian institutions show that even where policy is supportive, practical bottlenecks such as lack of computer labs, absence of in-service training focused on pedagogy, and weak technical support prevent consistent integration.

Sinazongwe District presents a compelling case for studying the limitations of technology integration. The district is predominantly rural, with many schools lacking adequate technological infrastructure, reliable electricity, and trained personnel. Teachers often rely on traditional instructional methods such as chalk-and-board teaching, which limits learner engagement and constrains the development of digital competencies. Furthermore, commercial subjects' teachers in rural schools may face unique challenges, including large class

sizes, limited access to teaching resources, low levels of ICT literacy, and insufficient administrative support (Chola, 2020).

Given the importance of technology in modern commercial education, understanding the barriers that rural teachers face is crucial for designing interventions aimed at improving classroom practices. It is against this background that the present study seeks to investigate the factors limiting technology integration in teaching commercial subjects in three selected secondary schools in Sinazongwe District.

Statement of the Problem

Although technology has been recognized as a powerful tool in enhancing teaching and learning outcomes, its integration into instructional processes in many rural schools remains inadequate. In Zambia, despite multiple policy initiatives aimed at promoting ICT use in education, the actual level of integration in rural areas has remained low (MoGE, 2019).

Preliminary observations and reports from teachers in Sinazongwe District suggest that several barriers hinder the effective use of ICTs in classroom instruction. These barriers include limited availability of teaching technologies, unreliable power supply, insufficient teacher training, lack of administrative support, and negative attitudes toward ICT use in teaching (Mudenda & Chigona, 2022). As a result, commercial subject teachers often rely on outdated pedagogical approaches that do not adequately equip learners with the skills demanded by the modern commercial environment.

The slow uptake and use of ICT by teachers is likely to jeopardize the envisaged provision of quality education in the background of overcrowded classrooms, shortage of teachers and inclusion of children with special needs in Sinazongwe District. Hence, it is important for the researcher to go out in the field to examine the factors that limit technology integration in teaching commercial subjects in rural secondary schools in Sinazongwe District.

Purpose of the Study

The purpose of this study is to examine the factors that limit technology integration in teaching commercial subjects in rural secondary schools in Sinazongwe District.

Specific Objectives

The study seeks to achieve the following objectives:

1. To identify the types of technologies currently available for teaching commercial subjects in the selected secondary schools in Sinazongwe District.

2. To determine the factors limiting the integration of technology in commercial subject classrooms.

3. To examine teachers' and administrators' perceptions of technology integration in rural educational environments.

4. To propose strategies that can be employed to overcome challenges and improve technology integration in the teaching of commercial subjects.

Research Questions

This investigation is guided by the following research questions:

1. What types of technology are currently available for teaching commercial subjects in the selected schools?

2. What factors limit the integration of technology in commercial subject teaching?

3. How do teachers and administrators perceive technology integration in rural schools?

4. What strategies can improve technology integration in commercial subjects in rural contexts?

Significance of the Study

This study is significant for several reasons. First, it contributes to the body of knowledge on ICT integration in rural education, an area where research remains limited in Zambia. While numerous studies have been conducted in urban settings, the unique challenges faced by rural schools have not been explored comprehensively.

Second, the findings of this study will be valuable to educational policymakers and planners seeking to improve ICT integration in commercial subject teaching. By identifying specific barriers and contextual limitations, the study will provide evidence-based recommendations for developing targeted interventions, allocating resources, and designing professional development programs.

Finally, the study will benefit learners by supporting the development of improved instructional practices that incorporate technology. This, in turn, can enhance their digital literacy, practical business skills, and preparedness for higher education and employment.

LIMITATIONS OF THE STUDY

During the course of conducting this study in selected rural secondary schools in Sinazongwe District, the researcher encountered several practical challenges in the field. These limitations, although managed to ensure completion of the study, may have had some influence on the scope, depth, and overall findings of the research.

The sampled three secondary schools affected generalizability of findings as the district had over ten secondary schools offering commercial subjects. The researcher also faced limited access to ICT facilities for observation. Since many of the schools had inadequate or non-functional ICT equipment, it was difficult to conduct comprehensive observational assessments of how technology is used in real classroom settings. In some cases, equipment such as computers or projectors was either not in use, locked away, or not operational due to power challenges. This limited the ability to triangulate interview responses with actual practice.

Lastly, logistical challenges related to scheduling and coordination were experienced. Coordinating appointments with multiple participants across different schools required careful planning, and unexpected changes in school schedules, meetings, or events occasionally disrupted the data collection process..

Delimitations of the Study

The study focuses specifically on technology integration in the teaching of commercial subjects such as commerce, business studies, accounting, and entrepreneurship. It does not include other subject areas. The research is delimited geographically to Sinazongwe District and will involve only three selected secondary schools. Furthermore, the study will target commercial subject teachers and school administrators, excluding students and teachers from other subject areas.

Definition of Key Terms

Technology Integration: The effective use of digital tools and ICT resources to enhance teaching and learning processes.

Commercial Subjects: Academic subjects including commerce, economics, business studies, accounting, and entrepreneurship that relate to trade, finance, and business operations.

ICT (Information and Communication Technology): Technologies used for accessing, processing, storing, and sharing information, such as computers, projectors, and the internet.

Rural Schools: Schools located in geographically remote, underserved areas with limited access to infrastructure and educational resources.

LITERATURE REVIEW

Introduction

This chapter reviews the literature related to technology integration in education generally, and the teaching of commercial subjects specifically. It draws on theoretical perspectives, empirical findings, and studies conducted in similar contexts to provide a foundation for the study. The literature is reviewed under three main sections: theoretical literature, empirical literature, and the research gap.

Theoretical Literature Review

Theoretical literature review is premised on the following three theories.

Technological Pedagogical Content Knowledge (TPACK) Theory

According to Mishra and Koehler (2008), TPACK is a way of thinking about the knowledge teachers need such as computer literacy and subject matter in order to integrate technology effectively into their classrooms. The proponents further argue that, teachers who exhibit best practices with ICTs are creative, flexible and adapt ways in which they navigate the constraints, affordances, and interactions within TPACK framework. Mishra and Koehler (2006) submit that at the heart of good teaching, there are three components; technology, pedagogy and content, plus the relationship among and between them which makes up TPACK. They further assert that TPACK consists of seven components.

Diffusion of Innovations Theory (Rogers, 2003).

This theory explains how innovations, including technology, spread through a social system. According to Rogers, the adoption of new technology depends on factors such as perceived usefulness, ease of use, compatibility with existing practices, and support from institutional leadership. In rural schools, where resources are limited, the adoption process may be slower due to environmental constraints, lack of training, and low awareness.

Empirical Literature Review

Studies from various regions indicate that technology integration is influenced by factors such as infrastructure, teacher competence, attitudes, and institutional support (Adu & Galloway, 2019). In sub-Saharan Africa, common challenges include limited connectivity, unreliable electricity, inadequate ICT resources, and teacher training gaps (Ngoma & Mwanza, 2021).

Teachers attitude and ICT Integration in Teaching and Learning

Kusano, Frederiksen, Jones and Kobayashi (2013) examined the teachers' attitude toward ICT integration in USA and Japanese elementary schools. The credence of their study was that though several studies in regard to teachers' attitude toward ICT had been done, international comparisons were yet to be done. The study participants comprised of the teachers at the elementary schools in southern Utah in the U.S.A and in Hokkaido (northern Japan). The teachers' perceived usefulness (PE), perceived ease of use and usability (PEUU), and attitudes toward using technology (AT) were identified through the technology acceptance model (TAM). Although the study showed that Japan availed lesser ICT resources in public education than USA, it is noteworthy that both economies are developed sand Technology environment may be quite different from Kenya.

A study done in Malaysia by Alazam, et al (2012) focused on vocational and technical teachers' ICT Integration in the Classroom and ICT Skills. The study found that most of the teachers use of ICT in classroom teaching was moderate, and that teachers' ICT skills was moderate. A significance difference was noted in

teachers' ICT skills as a function of demographic factors such as age, type of ICT training, gender, and years of teaching experience. It was also established that the correlations between ICT integration in classroom and ICT skills among teachers was significant. However, teachers' gender, age, and teaching experience did not influence ICT integration in classroom. While Alazam et al. (2012) study focused on vocational and technical teachers, the current study focused on primary school teachers.

In Ghana, Enu et al. (2018) investigated the ICT skills of basic school teachers and their ICT usage in the Classroom. Through Qualitative analysis, the study found that teachers' ICT skills were at the moderate level. Most of the teachers indicated that they use ICT for general and personal purposes such as communicating and chatting with friends as well as family members via Facebook, WeChat and WhatsApp. Teachers attributed their minimal ICT integration in their lessons due to lack ICT integration skills and ICT infrastructure. Enu et al., recommended a government sponsored continuous professional development for teachers focusing on ICT integration in teaching and learning.

In Zambia, Mudenda and Chigona (2022) found that rural schools still experience significant barriers in integrating ICT due to lack of funding and insufficient teacher skills to integrate technology with teaching subjects such as commerce and business studies.

In a study done by Chola (2020) in selected schools in Lusaka it was established that teaching of subjects is positively serving a role of training learners for effective use of technology. He further reported that commercial subject teachers, in particular, suffer from inadequate exposure to digital tools relevant to their subject area. It was recommended that Schools should strengthen local Continuous Professional Development (CPD) in order for them to develop their skills.

Availability of ICT facilities and ICT Integration in Teaching and Learning

Abuya (2019) emphasizes that provision of up to-date ICT infrastructure and teachers' digital literacy are prerequisite in successful implementation of ICT in schools. In fact, the presence of ICT infrastructure in a school would create curiosity and then action to even some of the most technophobic teachers. Furthermore, the availability of ICT resources that are vital in the implementation process are key factors in shaping the attitudes and perceptions of teachers towards ICT integration in learning process (Beri & Sharma, 2019; Kamaruddin et al. 2017; Nzwili, 2017; Sulemana, et al. 2018).

Sibanda, Mapenduka and Furusa (2016) study examined the use of ICT resources and factors that hindered maximum utilization of available ICT resources in Kwekwe, Zimbabwe. Some of the technologies assessed included computers, televisions, radios, interactive boards, networks, wireless technologies, internet, eLearning applications, email, projectors, and video conferencing. The research established that most ICTs such as interactive boards, computers and projectors were inadequate.

The Zambian government has prioritized technology integration in education through various initiatives and partnerships. The Ministry of Education has implemented programs aimed at enhancing ICT resources and providing teacher training to schools nationwide. These efforts align with the broader goal of modernizing the education sector to improve outcomes through technology (Ministry of Education, 2014). Partnerships with international organizations, including UNESCO and the World Bank, have facilitated the distribution of ICT equipment to schools, creating opportunities for digital learning (Chisanga & Muula, 2013).

In the study conducted in Kasenengwe District, Mwale (2014) noted that despite these advances, significant challenges hinder the effectiveness of technology integration in Zambian schools. Research highlights uneven resource distribution, inadequate infrastructure, and limited teacher proficiency, especially in rural areas. Schools often face inconsistent electricity supply and insufficient technical support, further limiting the use of digital tools (Mumba, 2017). This underscores the importance of addressing infrastructure challenges alongside providing technology. Targeted teacher training and capacity-building initiatives are essential for bridging these gaps. Studies emphasize the need for ongoing professional development to equip educators with the skills to integrate technology effectively into their teaching practices (Chisanga & Muula, 2013). This includes training in both the technical use of digital tools and pedagogical strategies to enhance learning

outcomes. Banda (2018) also identifies disparities in teacher training and resource availability as critical barriers to the success of ICT initiatives, calling for more equitable resource distribution.

Research Gap

Despite the extensive literature on ICT integration, few studies focus specifically on technology integration in commercial subject teaching in rural Zambian schools. Most existing studies examine general challenges in ICT use or focus on urban settings. Thus, the findings from such studies cannot be assumed to hold for Sinazongwe seconday schools. While international and regional reviews provide useful frameworks, there is strong justification for localized, context-sensitive studies. Barriers manifest differently across settings: what is a primary constraint in an urban school (e.g., inadequate pedagogical models) may be less important in a rural school where electricity and devices are the central problem. School culture, local leadership, community expectations, and the particular requirements of national curricula all shape the viability of technology initiatives (Zhao & Frank, 2003).

Sinazongwe District, like many rural districts, is likely to face a distinct combination of infrastructural and human capacity challenges that affect commercial subject teaching. A focused case study of three schools allows a fine-grained examination of how factors interact at the micro level: for instance, how a particular principal's leadership might compensate for limited infrastructure, or how teachers' prior vocational experience influences their willingness to adopt accounting software.

METHODOLOGY

Introduction

This chapter outlines the methodology employed in conducting the research. It describes the research approach, design, population, sampling procedures, data collection instruments, data collection procedures, data analysis plan, and ethical considerations.

Research Approach

The study adopted a qualitative research approach. Qualitative methods are suitable for exploring experiences, perceptions, and contextual factors that influence behavior (Creswell, 2018). Since the study sought to understand the factors limiting technology integration from the perspective of teachers and administrators, qualitative inquiry was appropriate.

Research Design

A case study research design was employed. Case studies allow for an in-depth examination of phenomena within real-life contexts (Yin, 2018). A case study was adopted because it allowed in-depth, contextual understanding of complex issues, especially for rare events or new phenomena, offering rich qualitative data, testing theories in real-world settings, generating hypotheses, and providing practical insights for policy/practice, making it ideal when a broad survey isn't enough for nuanced understanding.. The three selected secondary schools in Sinazongwe District, namely siameja secondary school, Nkandabwe secondary school and Sinanjola secondary school, served as cases, enabled detailed exploration of technology integration challenges.

Study Population

Population refers to all elements, individual or objects having similar observable characteristics (Creswell, 2014). The target population included all commercial subject teachers and school administrators, such as head teachers and deputy head teacher.

Study Sample size and Sampling Techniques

Babbie (2014) regards a sample as a subset of population. Purposive sampling was used to select participants who had direct experience with teaching commercial subjects or managing technology resources. A sample of

15 participants was selected in this study. The sample included 9 commercial subject teachers, 3 headteachers and 3 deputy head teachers from the 3 selected teachers. This sampling strategy ensured the inclusion of respondents who can provide relevant insights. The total number of Sample is shown in table 1 below below.

Table 1: Sample distribution per school

Number of school	Commercial Subject Teachers	Deputy Head Teachers	Head Teachers	TOTAL
Siameja secondary	3	1	1	5
Nkandabwe seondary	3	1	1	5
Sinanjola secondary	3	1	1	5
Total	**9**	**3**	**3**	**15**

Source: Field data (2026)

Data Collection Instruments

Data will be collected using the following instruments.

Interviews guide.

The interview guides w consisted of Likert scale that gathered quantitative data and open-ended questions that gathered qualitative type of information. The guide comprised of sections A, B, C, D and E. Semi-structured interviews allowed participants to express their experiences and perceptions.

Observation check list

The observation checklist provided a structured format for recording observations, often including contextual information like date, time, and location, as well as specific sections for different observation categories. Classroom and infrastructure observations helped assess the availability and use of technology.

Data Collection Procedure

Permission was obtained from the District Education Board Secretary (DEBS) and school administrators. Interviews was scheduled with teachers and administrators at convenient times. Observations were conducted during lesson hours or designated ICT periods. Data collection followed ethical guidelines to ensure confidentiality and voluntary participation.

Data Analysis Plan

Kombo and Tromp (2006) regard data analysis as the process of organizing the collected raw data in order to establish meaning or certain trends. Qualitative data was analyzed using thematic analysis. Interview transcripts and observation notes was coded to identify patterns and themes (Braun & Clarke, 2019). After coding, the data from questionnaire was fed into the Statistical Package for Social Sciences (SPSS) version 22 software for analysis. The data collected were analyzed with respect of the study objectives using both descriptive and inferential techniques.

Ethical Considerations

Ethical approval was sought from relevant educational authorities. Participants were informed about the purpose of the research, and their consent was obtained. Confidentiality was maintained through anonymity. Participants were allowed to withdraw at any stage without penalty.

PRESENTATION AND ANALYSIS OF FINDINGS

Introduction

This chapter presents, analyses, and interprets the findings of the study entitled *Factors Limiting Technology Integration in Teaching Commercial Subjects: A Case Study of Three Selected Schools in Sinazongwe District*. The purpose of the study was to examine the factors that limit technology integration in teaching commercial subjects in rural secondary schools. The analysis is guided by the specific objectives of the study. Data were collected through semi-structured interviews and observation checklists from a sample of fifteen participants comprising commercial subject teachers, head teachers, and deputy head teachers. Both qualitative and quantitative data were analysed using descriptive statistics and thematic analysis. The findings are presented using tables and figures for clarity and ease of interpretation.

Response Rate

The study targeted fifteen respondents, and all participants took part in the research. This resulted in a response rate of 100 percent, which was considered adequate for reliable analysis and valid conclusions.

Table 1: Response Rate of Participants Table

Category	Targeted	Responded	Response Rate (%)
Commercial Subject Teachers	9	9	100
Head Teachers	3	3	100
Deputy Head Teachers	3	3	100
Total	**15**	**15**	**100**

Source: Field data (2026)

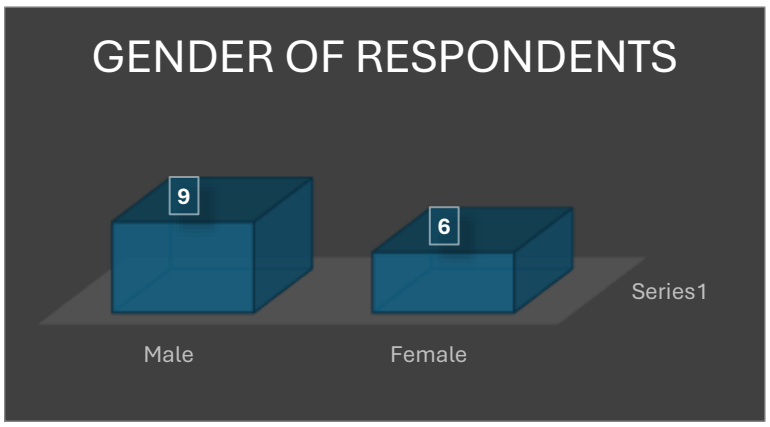
The full participation of respondents enhanced the credibility and reliability of the study findings

Demographic Characteristics of Respondents

Gender Distribution

Gender representation was considered important to ensure diversity of perspectives regarding technology integration.

Figure 4.2.1: Gender Distribution of Respondents



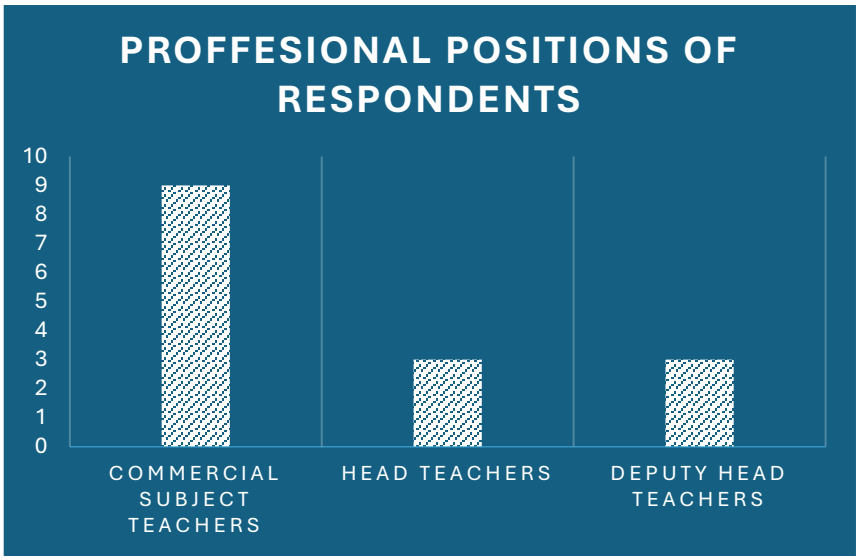
Source: Field data (2026)

According to the results indicate that 9 representing (60%) of paeticiapant s were males while 6 (40%) were females. The results indicate that both genders were adequately represented in the study. This important in order to have balances views in research.

Professional Positions of Respondents

This research also to capture different professional personnel involved in the process of teaching and implementations of policy in class. Figure 4.3.2 summarises the findings.

Figure 4.3.2: Professional Positions of respondents



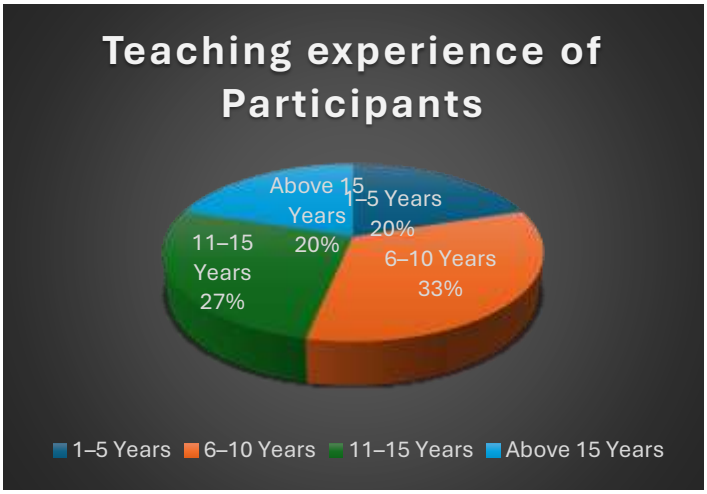
Source: Field data (2026)

According to figure 3.3.2 commercial teachers were the highest with 9 out of 15 participants (60%), while the number of head teachers and deputy headteachers was 3 (20%) for each category. The distribution ensured that both instructional and administrative perspectives were captured.

Teaching Experience of participants

Teaching experience of the teacher is one of the most important aspects to consider when getting information pertaining to teaching profession. Teacher's experience influences the understanding of the problem at hand.

Figure 4.3.3: Teaching Experience of Participants



Source: field data (2026)

In terms of teaching experience of participants, the pie chart above shows that the majority (33.3%) had between 6 and 10 years followed by those with between 11 and 15 years 926.7%). The number of participants with 1 to 5 years of teaching experience was the same as those with above 15 years of experience at 20% of the total (15). The majority of participants possessed substantial professional experience, enabling them to provide informed insights.

Availability of Technologies in Selected Schools

The researcher sought to identify the types of technologies available for teaching commercial subjects. These technologies are key to technological into the teaching Commercial subjects.

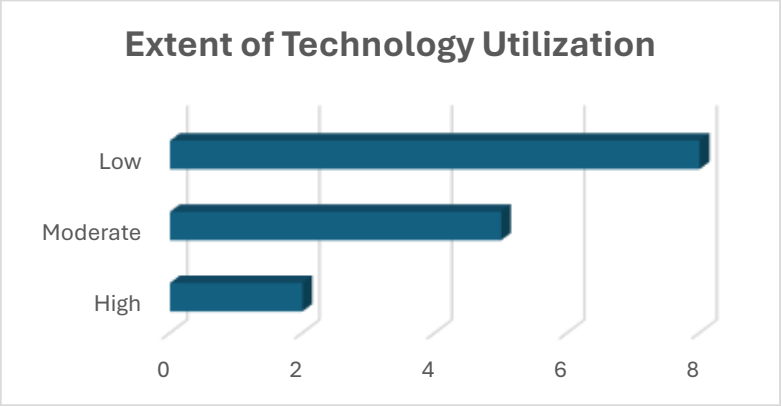
Table 2: Available ICT Technologies in Selected Schools

S/N	ICT Resource	School A	School B	School C
1	Desktop Computers	Limited	Limited	Not Aavailable
23	Laptops	Limited	Available	Limited
3	Printers	Available	Not Available	Not available
45	Photocopiers	Available	Not available	Not available
5	Projectors	Not available	Available	Not Available
6	Internet Connectivity	Limited	Limited	Not Available
7	Accounting Software	Not Available	Not Available	Not Available
8	Spreadsheet Software	Limited	Limited	Limited
9	Financial Calculators	Not available	Not available	Not available
10	Interactive Whiteboards	Not Available	Not Available	Not Available

Source: Field data (2026)

The findings indicate that although basic ICT tools were available, advanced technologies essential for teaching commercial subjects were largely absent.

Figure 4.4.1 Extent of Technology Utilization



Source: Field data (2026)

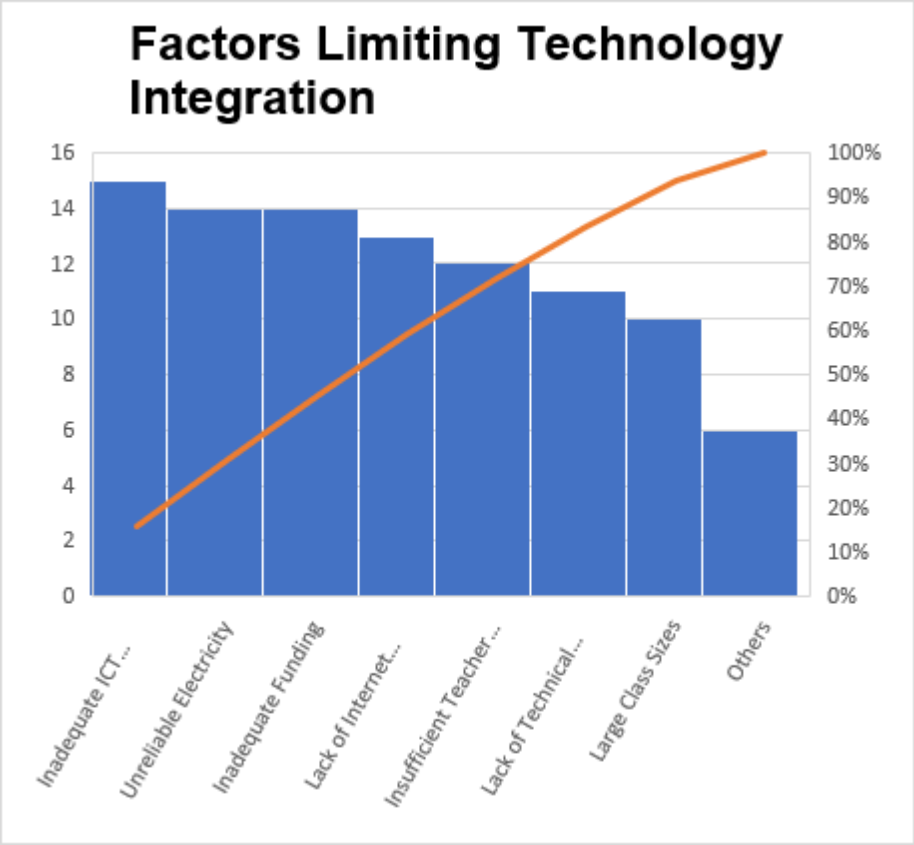
The Bar chart in figure 4.4.1 show the extent to which technology was being used in the three selected schools. The majority of participants, 8 representing 53.4% reported low utilization of available technologies due to resource constraints. While other participants (5) indicated moderated utilisation of ICT technology in the

teaching of commercial subjects, only 2 representing 13.3% admitted that there was high utilization of ICT technologies.

Factors Limiting Technology Integration

Different Participants were required to indicate the factors that limit technology integration in the teaching of commercial subjects. The researcher requested them to choose from the checklist and indicate whether the factors listed affected the integration of technology in the teaching the named subjects in the selected schools. Results are shown in figure 4.5 above.

Figure 4.5: Factors Limiting Technology Integration



Source: Field data (2026)

Among the factors that was found to limit the integration of ICT in the teaching of commercial subjects included inadequate ICT infrastructure where all the 15 (100%) participants reported it as a limiting factor. 14 participants representing 93.3% indicated that there was unreliable source of power. Others cited inadequate funding, lack of internet connectivity insufficient teacher training and teachers handling large classes as factors that limit integration of ICT in commercial subjects. In addition, only 6 out of 15 (40%) cited other factors such as negative attitudes towards ICT. These findings indicate that infrastructural and financial constraints are the primary barriers to technology integration.

Teachers' and Administrators' Perceptions of Technology Integration

There was also need to establish what participants admitted to be the benefit and importance integration of ICT in the teaching of commercial subjects.

Table 3: Perceptions Toward Technology Integration

Statement	Agree (%)	Disagree (%)
ICT enhances teaching effectiveness	93	7
ICT improves learner engagement	87	13

ICT is essential in commercial subjects	100	0
ICT prepares learners for employment	100	0
ICT simplifies accounting concepts	80	20

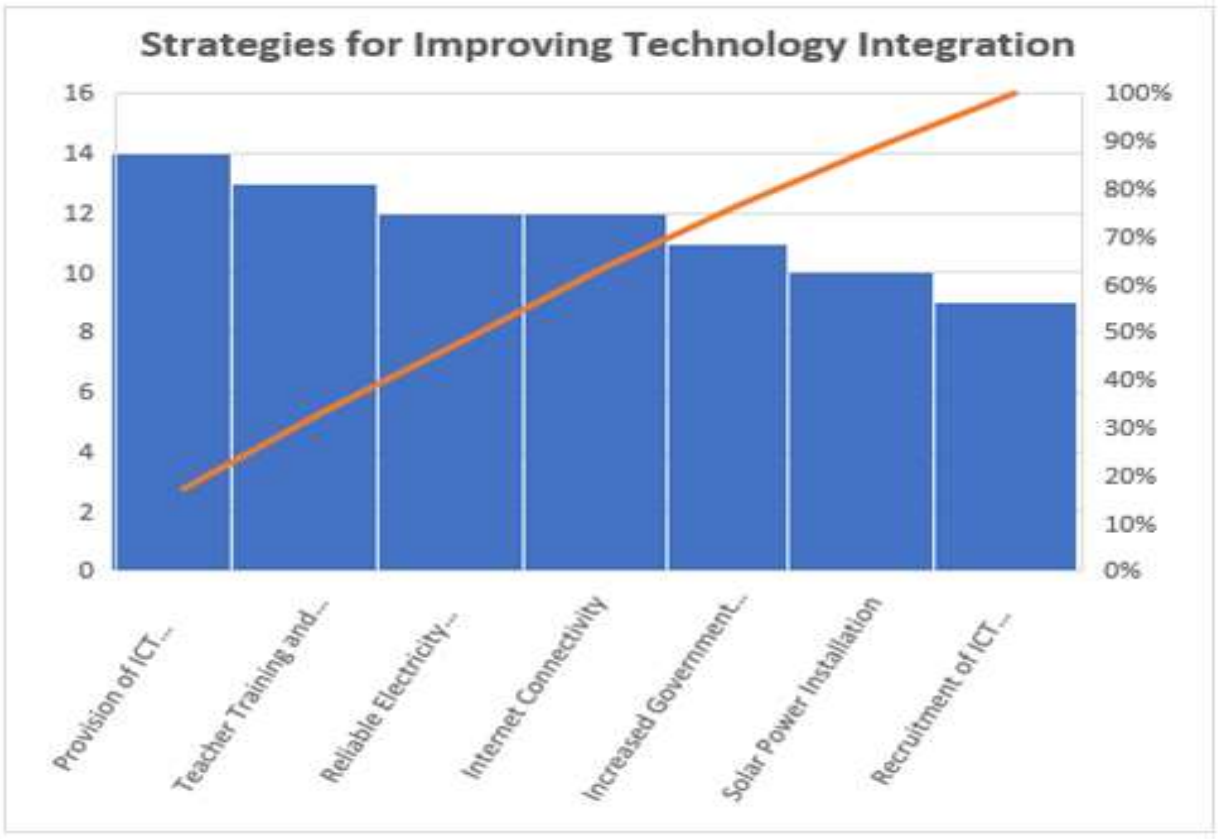
Source: Field data (2026)

According to table 3 above, most participants agreed that ICT integration is essential in commercial subjects. The findings indicate overwhelmingly positive attitudes toward ICT integration.

Strategies for Improving Technology Integration

Improving Technology integration in commercial subjects essential as any other field of study. Hence, the researcher wanted to finds out measures that can be put in place in order to improve ICT integration.

Figure 4.7: Proposed Strategies



Source: Field data (2026)

Figure 4.7 above presents the findings on the proposed strategies in order to promote ICT integrating in Commercial subjects. Most of the participants, 14 representing 93.3% reorted the need to provide ICT equipment, while almost the same number (13) out of 15 (86.7%) support the idea of teacher training. In addition, another great number of participants suggested the need to supply reliable electricity, which includes solar panel installation. Other suggestions included improvement in internet connectivity, increase government funding and recruitment of ICT technicians.

Summary of Chapter Four

The findings reveal that although basic ICT resources are present in the selected schools, technology integration remains limited due to infrastructural, financial, and capacity-related challenges. Despite these constraints, teachers and administrators demonstrate positive attitudes toward the adoption of technology in teaching commercial subjects.

DISCUSSION OF FINDINGS

Introduction

This chapter presents a detailed discussion of the findings obtained in Chapter Four. The discussion interprets the results in relation to the objectives of the study, which sought to examine the factors limiting technology integration in teaching commercial subjects in selected rural secondary schools in Sinazongwe District. The findings are also discussed in light of existing literature and theoretical perspectives on technology integration in education. The discussion is structured according to the major themes that emerged from the data, namely: response rate and reliability, demographic characteristics of respondents, availability of ICT resources, extent of technology utilization, factors limiting integration, perceptions of teachers and administrators, and strategies for improving ICT integration.

Response Rate and Reliability of Findings

The study achieved a response rate of 100 percent, as all fifteen targeted participants took part in the research (Table 1). This level of participation is highly significant as it enhances the reliability and credibility of the findings. The active involvement of all categories of respondents, commercial subject teachers, deputy head teachers, and head teachers ensured that the findings reflect a holistic view of the situation in the selected schools. This comprehensive participation strengthened the trustworthiness of the data, particularly because both instructional and administrative perspectives were captured.

Demographic Characteristics of participants

Gender Distribution

The study revealed that 60% of the participants were male, while 40% were female. This relatively balanced gender representation is important in ensuring that the findings are not biased toward one gender perspective. The inclusion of both male and female participants enriched the data, as gender can influence attitudes toward technology adoption.

Professional Positions of Participants

The distribution of participants showed that 60% were commercial subject teachers, while 20% were head teachers and another 20% were deputy head teachers. This distribution is significant because it captures both classroom-level experiences and administrative perspectives. Teachers, being directly involved in instructional delivery, provided insights into practical challenges faced during technology integration. This combination of perspectives allowed for a comprehensive understanding of the problem, as technology integration is influenced by both classroom practices and school-level leadership.

Teaching Experience of Participants

The findings indicated that the majority of respondents had between 6 and 10 years of teaching experience, followed by those with 11 to 15 years of experience. A smaller proportion had either less than 5 years or more than 15 years of experience (Fig 4.3.3). This distribution suggests that most participants were moderately experienced professionals who possess sufficient knowledge and exposure to teaching practices. Their experience enabled them to provide informed and credible insights into the challenges of ICT integration. Experienced teachers are more likely to understand both traditional and modern teaching approaches. However, research suggests that while experienced teachers possess pedagogical knowledge, they may require additional support to adopt new technologies effectively (Ertmer & Ottenbreit-Leftwich, 2013).

Availability of ICT Resources

One of the key findings of the study was that while some basic ICT resources were available in the selected schools, advanced technologies were largely absent. Resources such as desktop computers, laptops, and printers were either limited or unavailable, while more specialized tools like accounting software, financial

calculators, and interactive whiteboards were completely absent. This finding highlights a significant gap between policy expectations and actual resource availability in rural schools. Commercial subjects, by their nature, require practical exposure to tools such as accounting software and spreadsheets. The absence of these tools limits the effectiveness of teaching and learning.

Extent of Technology Utilization

Despite the presence of some ICT resources, the study found that the level of technology utilization was generally low for commercial subjects. More than half of the respondents reported low utilization, while only a small percentage indicated high utilization (Figure 4.4.1).

This suggests that the mere availability of ICT resources does not guarantee their effective use. Several factors may contribute to low utilization, including lack of skills, inadequate training, and unreliable infrastructure. The findings indicate that even when resources such as computers and projectors are available, they are not fully integrated into teaching practices. This may be due to a lack of confidence among teachers, limited technical support, or time constraints associated with large class sizes.

Factors Limiting Technology Integration

The study identified several key factors that limit technology integration in teaching commercial subjects (Fig 4.5).

Inadequate ICT Infrastructure

All respondents identified inadequate ICT infrastructure as a major barrier. This includes insufficient computers, lack of specialized software, and absence of modern teaching tools. Infrastructure forms the foundation for technology integration. Without adequate infrastructure, it is impossible to implement ICT-based teaching effectively.

Unreliable Power Supply

A large majority of respondents reported unreliable electricity as a major challenge. In rural areas, power outages are common, and some schools may not have access to electricity at all. This limitation makes it difficult to use ICT tools consistently, even when they are available. The suggestion to introduce solar power systems reflects the need for sustainable energy solutions in rural schools.

Inadequate Funding

According to finding, funding constraints were also identified as a key barrier to integration of ICT in comercial subjects. Schools often lack the financial resources needed to procure ICT equipment, maintain existing infrastructure, and provide training for teachers. Limited funding affects all aspects of technology integration, from acquisition of equipment to maintenance and capacity building. This highlights the need for increased government and stakeholder investment in education.

Lack of Internet Connectivity

In addition, funding constraints, internet access was found to be limited or non-existent in most of the selected schools. This restricts access to online resources, digital content, and interactive learning platforms. In the modern educational context, internet connectivity is essential for effective ICT integration. This finding is consistent with (UNESCO, 2021) which state that “Internet connectivity is essential for accessing up-to-date information and interactive learning tools”. Its absence significantly limits the potential benefits of technology in teaching and learning not only in commercial subjects but, all the other subjects.

Insufficient Teacher Training

The study found that many teachers lacked adequate training in the use of ICT. Without proper training, teachers may lack the skills and confidence needed to integrate technology into their teaching. The lack of adequate training limits teachers' ability to use ICT effectively. Tondeur et al., (2017) state that professional development is crucial for building both technical and pedagogical skills. This finding highlights the importance of professional development programs that focus on ICT skills and pedagogical integration.

Large Class Sizes

Large class sizes were also identified as a barrier. Managing ICT-based lessons in overcrowded classrooms can be challenging, particularly when resources are limited. This issue further complicates the integration of technology, as teachers may find it difficult to ensure that all students benefit from the lesson. This finding aligns with research indicating that overcrowded classrooms hinder innovation (UNESCO, 2021). With the coming of Constituency Development Funds (CDF), it is important to build more infrastructure to decongest classrooms.

Attitudinal Factors

Although most respondents had positive attitudes toward ICT, a small proportion cited negative attitudes as a barrier. Resistance to change and lack of motivation can hinder the adoption of new technologies. However, the relatively low percentage of respondents indicating negative attitudes suggests that this is not a major barrier compared to infrastructural and financial challenges.

Perceptions of Teachers and Administrators

The study revealed overwhelmingly positive perceptions toward ICT integration. Most respondents agreed that ICT enhances teaching effectiveness, improves learner engagement, and prepares students for employment (Table 3).

Positive attitudes are critical for successful integration, as they influence willingness to adopt new technologies (Ertmer & Ottenbreit-Leftwich, 2013). The findings suggest that the main challenge is not resistance but lack of enabling conditions. This is an important distinction, as it indicates that interventions should focus on infrastructure and training rather than attitude change.

Strategies for Improving Technology Integration

Participants proposed several strategies to improve ICT integration (Fig 4.7). The majority of respondents emphasized the need for increased provision of ICT resources. This includes computers, projectors, and specialized software. Provision of ICT equipment was identified as the most critical intervention. This aligns with the need to address infrastructural barriers.

In addition, training was identified as a critical component of successful ICT integration in commercial subjects. Professional development programs can equip teachers with the necessary skills and confidence. Continuous professional development (CPD) programs can enhance both technical and pedagogical competencies required for teachers to integrate.

Furthermore, one of the limiting factors is lack of adequate financial support for technological programs in schools. Greater financial investment is needed to support infrastructure development, training, and maintenance. In line with technical support, participants suggested recruitment of technical staff in schools. The presence of technical support staff would help in maintaining equipment and assisting teachers. These strategies align with international best practices for ICT integration (World Bank, 2020).

Summary of the Discussion

The discussion of findings reveals that technology integration in teaching commercial subjects in rural secondary schools is limited by a combination of infrastructural, financial, and capacity-related challenges. While basic ICT resources are available, they are insufficient and underutilized. Despite these challenges, teachers and administrators demonstrate positive attitudes toward ICT, indicating a strong potential for improvement. Addressing the identified barriers through targeted interventions can significantly enhance the integration of technology in teaching commercial subjects.

CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter presents the conclusions and recommendations of the study on the factors limiting technology integration in teaching commercial subjects in selected rural secondary schools in Sinazongwe District. The conclusions are drawn from the findings presented in Chapter Four and the discussion in Chapter Five. The chapter is organized into the following sections: summary of the study, conclusions based on the research objectives, implications of the findings, recommendations, limitations of the study, and suggestions for further research.

Summary of the Study

The purpose of this study was to examine the factors limiting the integration of Information and Communication Technology (ICT) in the teaching of commercial subjects in rural secondary schools. The study was guided by specific objectives which included assessing the availability of ICT resources, determining the extent of their utilization, identifying factors limiting integration, examining perceptions of teachers and administrators, and proposing strategies for improvement.

A case study design was adopted, focusing on three selected schools in Sinazongwe District. Data were collected from a total of fifteen respondents, comprising commercial subject teachers, head teachers, and deputy head teachers. The study utilized semi-structured interviews and observation checklists, allowing for both qualitative and quantitative data collection. The data were analyzed using descriptive statistics and thematic analysis.

The findings revealed that although some basic ICT resources were available in the schools, they were inadequate and insufficient to support effective teaching of commercial subjects. The study also found that the utilization of available technologies was generally low. Several factors were identified as barriers to ICT integration, including inadequate infrastructure, unreliable electricity supply, limited funding, lack of internet connectivity, insufficient teacher training, and large class sizes.

Conclusions

The conclusions of the study are presented in line with the specific objectives that guided the research and the findings.

Availability of ICT Resources

Concerning availability of ICT resources, the current study concludes that ICT resources in the selected schools are inadequate for effective integration in the teaching of commercial subjects. While some schools have access to basic tools such as computers and printers, these resources are limited in number and are not sufficient to meet the needs of both teachers and learners.Furthermore, essential tools required for commercial subjects, such as accounting software, financial calculators, and interactive teaching technologies, are largely unavailable. This lack of appropriate resources limits the ability of teachers to provide practical, skills-based instruction, which is critical in commercial education.

Extent of ICT Utilization

With regards to ICT utilization, this study concludes that the level of ICT utilization in teaching commercial subjects is generally low. Even where ICT resources are available, they are not fully integrated into classroom practices.

This low level of utilization is attributed to several factors, including lack of technical skills among teachers, limited access to equipment, and inadequate support systems. The findings suggest that the presence of ICT resources alone does not guarantee effective use; there must also be sufficient capacity and support for teachers to integrate technology into their teaching.

Factors Limiting ICT Integration

The study concludes that ICT integration is constrained by a combination of infrastructural, financial, and human capacity challenges. Inadequate ICT infrastructure is identified as the most significant barrier, as it directly affects the availability and accessibility of technology in schools. Unreliable electricity supply further limits the use of ICT tools, especially in rural areas where power outages are frequent.Financial constraints also play a major role, as schools lack the resources needed to acquire, maintain, and upgrade ICT equipment. The absence of reliable internet connectivity restricts access to digital learning materials and online educational platforms. Additionally, insufficient teacher training reduces the confidence and competence of teachers in using ICT. Large class sizes make it difficult to implement ICT-based teaching strategies effectively, as limited resources must be shared among many learners. Although some respondents mentioned negative attitudes toward ICT, the study concludes that attitudinal factors are not the primary barrier. Instead, structural and resource-related challenges are the main obstacles to ICT integration.

Perceptions of Teachers and Administrators

It was found that teachers and administrators have overwhelmingly positive perceptions toward ICT integration. The majority of respondents believe that ICT enhances teaching effectiveness, improves learner engagement, simplifies complex concepts, and prepares students for employment. These positive attitudes indicate a strong willingness among educators to adopt technology in teaching. However, the lack of enabling conditions prevents them from effectively implementing ICT in their classrooms.

Strategies for Improving ICT Integration

The current study concludes that improving ICT integration requires a comprehensive and coordinated approach. The key strategies identified include the provision of adequate ICT equipment, teacher training, reliable electricity supply, improved internet connectivity, increased funding, and recruitment of ICT support staff.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. The government and relevant stakeholders should invest in the provision of adequate ICT infrastructure in rural schools.
2. To address the challenge of unreliable electricity, schools should be supported to adopt alternative energy sources such as solar power systems.
3. Continuous professional development programs should be implemented to enhance teachers' ICT skills.
4. The government should allocate more financial resources to support ICT integration in schools.

SUGGESTIONS FOR FURTHER RESEARCH

Future studies should expand the scope to include more schools and different geographical areas to enhance

generalizability. Comparative studies between rural and urban schools could provide deeper insights into disparities in ICT integration.

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