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Factors Hindering the Teaching and Learning of Computers in Secondary Schools in Chiwundura: A Case of Four Secondary Schools in Chiwundura Cluster, Gweru, Zimbabwe

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ABSTRACT

The study sought to examine the factors that hinder the teaching of computers in four selected secondary schools in Chiwundura Cluster Centre in Gweru in Midlands Province in Zimbabwe. Teaching and learning of computers in educational institutions cannot be over-emphasized the world over, as computers are now the lifeblood of any society. The study adopted a mixed research approach, thus the use of interviews, questionnaires and observations. 20 respondents who are teachers selected using probability sampling method from four (4) selected secondary schools from a pool of 5 secondary schools in the cluster. The findings established that some of the secondary schools in Chiwundura do not have computers hence this problem has contributed much to the non-teaching and learning of computers in Chiwundura secondary schools. The study revealed that lack of trained teachers and poor funding were considered as the major causes to the non-teaching and learning of computers in secondary schools, computer illiteracy, lack of computer usage infrastructure among others were negatively affecting the teaching of computers in selected secondary schools in Chiwundura. The study concluded that teacher training institutions should train more computer teachers for to curb the shortage of trained personnel that are meant for the teaching and learning of computers. In a bid to eliminate the non-teaching and learning of computers, schools' administrators need to be trained or oriented on how to implement the teaching and learning of computers in secondary schools. The study recommended the stakeholders to resume the computerization and the rural electrification programmes as well as introduce the use of alternative source of power like solar energy. Further recommendations were that administrators in secondary schools in Chiwundura should priorities the implementation of the teaching and learning of computer studies when making their budgets, hence the need for the acquisition and development of computer infrastructure in their schools.

Computers, Secondary schools, Teaching and learning.

INTRODUCTION

In recent years, the integration of computer usage in teaching and learning has become a crucial component for the advancement of any society, functioning as its lifeblood. In developed nations such as the USA, Australia, Britain, Mexico, and the Netherlands, there is a notable prevalence of computers in educational curricula. Merireng (2013) highlighted that students in these countries are experiencing widespread access to computer studies as a formal subject within their educational frameworks. According to Osakwe (2012), over 80% of secondary schools in the USA now offer computer education, reflecting a significant commitment to equipping students with essential digital skills. This shift indicates that educational institutions have evolved to incorporate technology, adapting to the ever-evolving landscape of information and communication technologies (ICT). In contrast, Adebayo (2016) and Mwebaza (2017) respectively noted that Nigeria and Zambia showcased the complexities surrounding the integration of computer education within their

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educational systems. Nigeria, despite having a growing technology sector, faced challenges such as inadequate infrastructure and intermittent electricity, which hindered effective implementation of computer studies in schools. Similarly, in Zambia, efforts to promote ICT in education are hampered by resource limitations and uneven access to technology across urban and rural areas. Zimbabwe is likely to face similar challenges. The thrust of this study was to investigate the factors that impede the teaching and learning of computer studies in secondary schools within the Chiwundura cluster, specifically focusing on four secondary schools in Gweru.

BACKGROUND OF THE STUDY

In this present age of globalization, the teaching and learning of computers is continually widening between the developing and developed nations. Mkandawire (2004), claim that educational institutions in some of African countries, such as Rwanda, are still lagging behind in adopting the teaching and learning of computers in schools. In a report entitled *'ICT integration in schools: (2012)*, the World Bank states that the mammoth task confronting education policy-makers in Africa is the alignment of educational institutions and their practices with the rapid mounting demands of globalization and the technology-driven world.

Developed countries such as Britain and America were the first to adopt the teaching and learning of computers in urban secondary schools, with the aim of impart computer skills to the learner in response to the technological changes the world over (Asiabaka, 2010), (BECTA, 2007), (Anulika, 2014). The benefits of learning computers include the acquisition of computer related skills as well as the effectiveness and efficiency in the use of ICT tools in workplaces among others. In most African states, the teaching and learning of computers in secondary schools was adopted in the late 80s and early 90s (Atulomah, 2011). Mndzebele (2013) and Osakwe (2012) posit that in Swaziland and Tanzania, the teaching and learning of computers was only adopted in 1993 and 1997 respectively.

Mkandawire (2004) asserts that in Zimbabwe, the teaching and learning of computers in schools was not a common phenomenon and was only adopted in Zimbabwe's secondary schools in 2002 following recommendations by the Nziramasanga Education Commission Report of 1999 on the use of computers for teaching and learning of computers studies in schools. This was in sync with Kabweza (2012), who indicated that the distribution of computers in the schools in Zimbabwe started in the year 2000, when the then late President of the Republic of Zimbabwe, Cde. Robert G. Mugabe donated computers to schools during the Presidential e-Learning Programme Musarurwa's (2011) study revealed that since 2002 most of Zimbabwe's urban secondary schools started adopting the teaching and learning of computers. Mandoga*et al* (2013) posit that the teaching and learning of computers in Zimbabwe' rural secondary schools was below 5%, but there were serious indications of computer exploitation for the teaching and learning of computer studies in rural secondary schools in Makoni East district. However, Konyana and Konyana (n.d) claim that most rural secondary schools in Zimbabwe are now treating computer studies as a compulsory subject just like Mathematics, Science and English language due to technological demands.

Computer illiteracy has a negative impact on national development due to ineffective and inefficient use of ICTs (Mandoga *et al.* , 2013). However, there is no doubt that the growing number of computer illiterate people in Chiwundura district has a negative effect in the general development of Chiwundura area and Zimbabwe at large. As claimed by Mwalongo (2011), computer illiteracy also increases ineffectiveness and inefficiency at workplaces due to inability in the use of ICTs. Therefore, this research wants to establish the factors hindering the teaching and learning of computers in secondary schools in Chiwundura cluster in Gweru rural district.

The study of computers equips learners with the practical skills in the use of ICT tools. Mkandawire (2004) posit that computer studies enhance learners' effectiveness and efficiency in computer related tasks. Computer studies also enables users to function properly in the prevailing socio-economic and technological environments, hence promoting self-reliance in the use of ICT tools in promoting economic growth and national development through ownership and exploitation of ICT tools.

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Statement of the problem

The purpose of this study was to identify the factors hindering the teaching and learning of computers in secondary schools in Chiwundura. Secondary schools in Chiwundura appear to be living in pre-historic era in terms of teaching and learning of computers, despite the enormous advantages embedded in the use of computers. Gweru Rural District has the highest number of computer illiterates emanating from the non-teaching and learning of computers in schools. However, there are a few secondary schools in Gweru Rural, including those in Chiwundura cluster, which have computers, but they are not meant for the teaching and learning of computers as a subject, as required by the new curriculum. In most cases, some of the secondary schools in Chiwundura do not have a single computer, even for the administrative work purposes. The acquiring of computer skills has proven to be a necessary skill of modern times due to their contribution towards effectiveness and efficiency in the world of work including their application in all facets of our lives. The non- teaching and learning of computers in secondary schools in Gweru Rural particularly in Chiwundura Cluster was the main problem to be investigated in this study.

Research objective

The main research objectives of this study are:

1. To assess the accessibility and use of computers for teaching and learning about computers as a curriculum subject in secondary schools in Chiwundura cluster.

2. To identify the factors that impede the teaching and learning of computer studies in secondary schools in Chiwundura cluster.

3. To explore strategies that can be implemented to address the challenges affecting the teaching and learning of computer studies in secondary schools in Chiwundura cluster.

Theoretical framing

The study was framed and synthesized under several educational theories thus: the Technological Pedagogical Content Knowledge (TPACK) framework, Social Constructivism, and the Socioeconomic Status (SES) theory as shown by Figure 1 below:

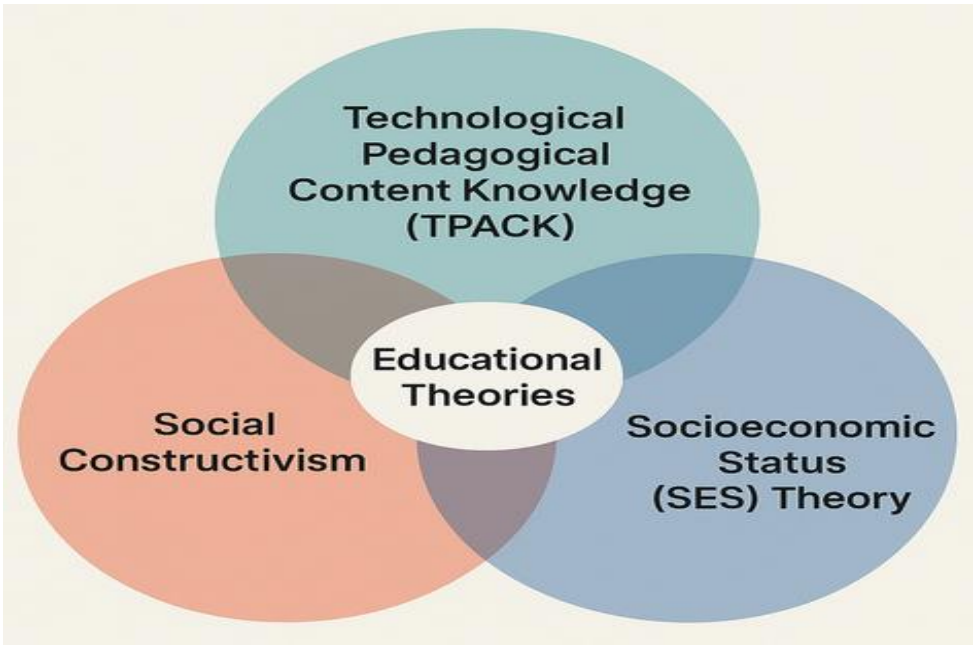


Figure 1: Integration of Technological Pedagogical Content Knowledge (TPACK) framework, Social Constructivism, and the Socioeconomic Status (SES) theory: Author's Illustration

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The diagram is a three-circle Venn diagram that visually represents the relationship between TPACK, Social Constructivism, and Socioeconomic Status (SES) Theory. Each circle is distinctly colored, making it easy to differentiate the three theoretical frameworks. The overlapping areas highlight the conceptual intersections, while the center is where all three circles meet and contains the label **"Educational Theories"**, signalling the combined influence of all frameworks when integrated.

The TPACK, framework, was developed by Mishra and Koehler (2006), provides a comprehensive understanding of the interplay between technology, pedagogy, and content knowledge in education. Its position at the top of the diagram visually conveys its role in shaping instructional design and digital integration. The overlap between TPACK and the other theories suggests that technological competence intersects with both social learning principles and contextual socioeconomic factors that influence technology access and use. This framework suggests that effective computer teaching requires not only access to technological resources but also teachers' ability to integrate technology into their teaching strategies. In Chiwundura, insufficient training for educators on how to effectively employ computer technology in the classroom limits students' learning opportunities. Teachers may not feel confident in using computers as teaching tools, leading to a lack of motivation and engagement in computer education (Ertmer & Ottenbreit-Leftwich, 2010).

Social Constructivism, as proposed by theorists like Vygotsky (1978), emphasizes the role of social interactions and cultural context in the learning process. The Social Constructivism circle, located on the left, represents learning as a socially mediated process. Its intersection with TPACK implies that effective technology integration must support collaboration, interaction, and meaning-making. Meanwhile, the area where Social Constructivism intersects with SES Theory acknowledges that learners' social environments and cultural experiences, shaped in part by socioeconomic conditions, play a central role in how knowledge is constructed. In Chiwundura, the cultural perception of computers and technology significantly influences both teacher and student attitudes toward computer education. If the community undervalues computer skills in favour of traditional methods, it can create a socio-cultural barrier to engagement with technology. This situation impacts both teachers' willingness to adopt computer teaching methods and students' enthusiasm to learn, thereby hindering the development of critical technological competencies.

The Socioeconomic Status (SES) theory highlights the importance of social and economic conditions in shaping educational access and quality (Coleman et al., 1966). The SES Theory circle on the right highlights the influence of socioeconomic conditions on educational opportunities, resources, and outcomes. Where it overlaps with TPACK, the diagram suggests that economic factors affect access to technology and digital learning tools. The shared intersection of all three circles symbolizes the idea that educators must consider technological skills, social learning processes, and socioeconomic barriers together when designing equitable and effective learning experiences. In many parts of Chiwundura, the lack of resources, such as computers, internet access, and electricity, is a reflection of broader socio-economic challenges. Families with low SES may prioritize basic needs over computer education, thereby limiting students' exposure to technology outside of school. Additionally, schools may struggle to afford necessary educational technology, thereby affecting the implementation of computer curricula in the classroom. The intersection of low SES and inadequate resources severely constrains the ability of schools to provide high-quality computer education, perpetuating a cycle of digital exclusion.

The integration of the three theoretical framework is worthwhile to this study because it visually synthesizes how TPACK, Social Constructivism, and SES Theory collectively shape the challenges and possibilities of technology-enhanced learning. The intersection of these three theories highlights that effective digital instruction is not solely about technological competence, but it must also account for how learners construct knowledge through social interaction and how socioeconomic conditions influence students' access, support, and participation. This integrated view helps the study justify why educational interventions must be designed with technological, pedagogical, social, and equity-related factors in mind in order to fully understand and address disparities in digital learning environments.

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REVIEW OF RELATED LITERATURE

Accessibility and use of computers for teaching and learning about computers as a curriculum subject in secondary schools in Chiwundura cluster.

Teaching and learning computer skills in schools is essential globally for improving productivity and efficiency in producing goods and services (Osakwe, 2012). The push for computer education stems from the numerous significant advantages these tools offer. Osakwe (2012) emphasized that not only is computer education convenient, but it can also elevate production standards in the workplace. Morgan and Rhode (1999) noted that educators view computers as effective labor-saving devices. Historically, computer education has received less focus compared to its applications in administrative tasks. Research indicated that developing countries lag behind developed nations in integrating computer education in schools, despite recognizing its importance. Saiti and Prokopiadou (2009), as referenced in Makewa et al. (2013), compared the implementation of computer teaching in schools to the modernization of technology. More so, according to Long and Johnson (2000), most of the schools in developed countries such as Britain and Australia have computers used in the teaching and learning of computer studies. Long and Johnson (2000) claim that 95% of Britain's schools have computers. In Australia, Baskin and Williams (2006) posit that the availability of computers in schools is claimed to be more than 87%. Bhattachejee (2012) asserts that in the United States of America, nearly every learner have a personal computer in all secondary schools. However, Merireng (2013) claim that due to the availability of computers in the developed countries, Britain, Australia and the USA included, there is a widespread utilisation of computers for the teaching and learning of computers in schools. Long and Johnson (2000) asserts that in Britain, legislative provisions have compelled for the utilisation of computers for the teaching and learning of computers in schools.

In sub-Saharan countries like South Africa and Botswana, Aduwa-Ogiegbaen and Iyamu (2005) reported a satisfactory availability of computers in schools. Specifically, they noted that over 70% of rural secondary schools in South Africa utilize computers predominantly for teaching computer studies, while Botswana boasts computer availability above 77% across schools, regardless of location. This high level of access has contributed to more advanced teaching and learning of computer skills in these regions.

Conversely, Manduku et al. (n.d.) highlighted issues in Kenya, where, despite having computers in nearly all secondary schools since the 1980s, the actual usage remains unsatisfactory. Mwalongo (2011) further emphasized that in Tanzania, despite numerous initiatives to enhance computer education, utilization for both teaching and professional development is minimal. In Zimbabwe, Mandoga et al. (2013) found that while most urban secondary schools have computers, overall availability is deemed unsatisfactory, with the country ranking low on the ICT Network Readiness Index. It was noted that students often bring their own computers, yet many rural schools lack any computers entirely for teaching the subject. While there have been improvements in certain districts, Musarurwa (2011) pointed out significant underutilization of computers in schools due to a lack of qualified personnel, leading to recommendations for an audit to assess the effective use of computers provided through government initiatives.

However, in Chiwundura District, Mkandawire (2004) claimed that 95% of the secondary schools have no computers hence making it practically impossible to conduct the teaching and learning of computers. Mkandawire (2004) further claim that in those secondary schools where computers are available, the ratio of computer use was unacceptable. For example, in Chiwundura cluster, Chiwundura High school has 15 computers against 645 learners, which is inconsistent with the Zimbabwe's Ministry of Information and Communication Technology's 2010-2014 strategic plan of having one computer per learner by 2014. Mkandawire (2004) asserts that the shortage of computers in schools under study as well as the shortage of trained teachers who have specialised to teach computers did not permit schools to conduct computer lessons hence this study sought to establish whether these are the causes to the non-teaching and learning of computers in Chiwundura secondary schools.

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Factors that impede the teaching and learning of computer studies in secondary schools in Chiwundura cluster.

The non-teaching and learning of computers in schools throughout Zimbabwe and other African nations can be traced to a variety of interrelated causes. One of the most significant challenges is the lack of adequate infrastructure. Many schools struggle with unreliable electricity and insufficient access to computers and the internet, which are essential for effective tech education. Chikasha (2019) highlights that inadequate technological resources in schools create barriers that make it nearly impossible to integrate computer education into daily learning. Similar sentiment were echoed by Hennessy et al. (2020), who noted that as technology becomes more integral to modern education, the absence of infrastructure not only limits access to computers but also stifles the interest and motivation of both teachers and students. This would therefore result in schools without these vital elements to struggle to integrate computer education into their curricula, limiting students' exposure to essential technological skills that are critical in the modern world.

Furthermore, Mkandawire (2004) argued that many institutions in rural areas end up seeing the teaching and learning of computers as a programme that is not top on their priority lists as they have to deal with lack of accommodation, electricity and telephones first. Additionally, those institutions that have access to computers usually experience difficult challenges with the costs of maintenance and servicing them. More so, various studies show that obstacles to the implementation of the teaching and learning of computers are interrelated and need to be addressed so that the situation will not continue. It appears that most of the developing countries, including Zimbabwe are confronted with numerous challenges inhibiting the teaching and learning of computers in schools.

Another critical barrier is the shortage of qualified personnel trained to deliver computer education effectively. Many teachers in developing countries lack sufficient training in information and information communication technology (ICT), hindering their ability to facilitate computer literacy among students. As Ertmer and Ottenbreit-Leftwich (2013) noted, professional development opportunities for teachers in ICT are often insufficient, leaving them unprepared to integrate technology into their teaching practices. This gap in training can perpetuate a cycle where students do not engage with computers meaningfully, as they are primarily reliant on teachers who may themselves be unsure of how to navigate technological tools. Welzel (2015) further highlighted that without proper training, teachers may feel overwhelmed and inadequate, leading to a reluctance to incorporate computers into their teaching practice.

Cultural attitudes towards technology significantly influence the emphasis on computer education in schools. In Zimbabwe, traditional subjects like mathematics and literacy often take precedence over digital literacy, overshadowing the importance of computer education (Mansions, 2017). These cultural perceptions impact parental expectations and educational priorities, contributing to a neglect of computer-based learning. Kafele (2016) emphasized that such biases can lead educational systems to undervalue necessary skills for success in a digital workforce. Mtebe and Raisamo (2014) further supported this notion by pointing out that these educational perceptions can hinder the development of essential digital skills among students.

Socioeconomic factors also play a crucial role in the ineffectiveness of computer education in schools. In areas with high poverty rates, families often struggle to afford the technology necessary for academic success (Mahlknecht et al., 2021). This economic hardship limits investment in both technology and education. Warschauer and Matuchniak (2010) highlighted that the digital divide results in substantial disparities in access to educational resources, including computers and the internet, restricting digital literacy development among students from lower socioeconomic backgrounds. Afful-Dadzie (2020) found that limited financial resources can demotivate students, as they may feel less prepared for a technology-driven world. Pelgrum (2001) pointed out that varying levels of commitment and resources dedicated to technology in education hinder cohesive efforts to teach essential computer skills. The absence of a structured policy framework prioritizing technology exacerbates these issues, making it challenging for schools to effectively integrate computer education. Gumbo (2020) stressed the need for on-going governmental support and policy implementation to improve the teaching and learning of computers in schools, particularly in regions facing numerous internal and external challenges. Anulika (2014) identified both factors contributing to these

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challenges, including Africa's dependence on external assistance, unfavorable economic conditions, and internal issues such as poor governance and corruption, which collectively impede the integration of modern technologies in education.

Strategies that can be implemented to address the challenges affecting the teaching and learning of computer studies in secondary schools in Chiwundura cluster.

Seidman (1996) concurred with Mintz (1997) that teacher training was the best solution to enhance the teaching and learning of computers. Mintz (1997) also suggested that respective governments should do more in their budgets to include budgets for the acquisition of ICT tools such as computers meant for the teaching and learning of computers in schools. James (2004) suggested a host of strategies that can be used in curbing computer illiteracy the world over.

Teacher Training

Seidman (1996) conducted a study into issues surrounding teacher training and its relationship with the successful implementation of computers studies in schools. Along with the statistical analysis, Seidmen (1996) found that handwritten comments by teacher respondents overwhelmingly expressed a need for teacher training for the teaching of computers in schools. Mintz (1997) recommended that teacher training for the teaching of computers should not be limited to teachers who teach computers or who intend to teach computers only, but to all those involved in the teaching of learners in schools. However, Seidmen (1996) recommended for an international trend on the part of educators to train all teachers in the teaching of computers. This need for teacher training is explained by the fact that most of the presently hired teachers received little or no training in their formal education in computers. It could also be a reflection of the need to update teachers' knowledge in the world of fast moving technology of communication. This strategy was used by the British government in 1966 when there was a serious shortage of trained personnel to teach computers studies some years after implementing the programme (Merireng, 2013).

Mintz (1997) asserted that training teachers for the teaching of computers is of paramount importance when considering integrating computer studies in schools. Mintz (1997) echoed Seidmen's (1996) view that training teachers for the teaching of computers was one of the strategies to successfully implement the teaching and learning of computers in schools. The Office of Technology Assessment Report (cited in Geisert and Futrell, 1995) was written for the U. S. Congress to provide federal policy-makers an information base for making long-term decisions about the teaching of computers in education. The OTA report lists adequate teacher training as one of the recommendations in the report and providing adequate teacher training programs in computer studies. The OTA also recommended for the need of continued in-service computer training programs as technology changes, as more effective uses of technology are developed, and as research provides a better understanding of how children need to learn computer skills. Geisert and Futrell (1995) argued that teachers are crucial in implementing computers studies in the classroom. McKenzie (1994), Solomon (1995), Bennett (1996) and Holzberg (1997) concurred that teacher training is necessary for the teaching and learning of computers in schools is to occur. However, key to teacher training is drawing a link between pedagogy and technology.

Development and acquisition of computer infrastructure

Availability and accessibility of computer infrastructure and resources such as hardware and software is an essential condition to effective adoption and integration of the teaching and learning of computers in schools. Mndzebele (2013) claim that acquisition of computer hardware and software as one the major strategies that can enhance the teaching and learning of computers in schools. Middleton, Flores and Knaupp (1997) view the hardware factor as an accessibility barrier. Middleton et al (1997) argue that computers need to be situated in classrooms where they can be easily accessed by students and used in a meaningful and pragmatic way. The barrier of poor or limited accessibility prevents true integration of computer lessons in schools. In order to be true tools for learning, computers need to be on hand when the need arises.

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Furthermore, the absence of suitable rooms for the computer equipment was a challenge in most schools in Africa as some did not have suitable buildings at all. Webb (2010) state that plans for integrating the teaching and learning of computers at such schools would require the construction of special rooms which can be pricey. Webb (2010) also asserts that there was need of installing air-conditioning systems in the computer rooms for countries with extremely high temperatures. The strategy of acquiring computers infrastructure was used by the government of Swaziland prior to the adoption of the teaching and learning of computers in Swaziland's rural schools.

Inclusion of school's computerisation programme on national budgets

James (2004) observed that when school administrators have tight budget constraints, and introducing technology may not be their top priority. GESCI (2009) observed that schools were faced with financial challenges for them to acquire computers for the teaching and learning of computer studies, as well as maintaining them due to technological obsolescence. However, Onyije and Opara (2013) concurred that in such instances there is need for respective governments to put aside funds mainly for the computerisation programmes in schools. These funds can be used for purchasing computer hardware and software, training teachers to teach computers, financing school electrification programmes and building of computer room just to mention but a few. Mwalongo (2011) found that lack of funding frustrated progress for the teaching and learning of computers in schools. Various research studies show that poor funding patterns by African governments was a major problem hindering the acquisition of computers in the African education systems. For example, the government of Tanzania rarely prioritise budgeting for ICTs in their national budgets (Mwalongo, 2011). In Kenya, Osakwe (2012) claim that most of the computer equipment used in schools was acquired through school development programmes.

Relaxation of import laws on computer hardware

Mkandawire (2004) argued that acquiring computer hardware locally was too expensive hence the need to consider purchasing them from beyond our borders. However, Morton (1997) observed that most countries had strict laws regarding imports of electrical gadgets such as computers. In view of this, Mkandawire (2004) recommended for the relaxation of import laws on computer hardware purchases so as to enable even the low income generating schools to purchase ICT equipment for the teaching and learning of computers in schools.

Introducing electrification programme in schools

Mndzebele (2013) argued that electricity was paramount to the implementation of the teaching and learning of computers in schools. Musarurwa (2011) observed that most rural schools were not electrified, hence the need to introduce electrification programmes so as to enhance the teaching and learning of computers in rural schools. Mandoga*et al* (2013) recommended that in order to successfully implement computerization in rural schools, respective governments should first ensure that schools were electrified. Mwalongo (2011) also concurred with Mandoga *et al*'s (2013) recommendation and said that electrification of schools was one of the major strategies of introducing computerization in schools.

Training of school administrators

Leadership is very important in every human endeavour including the education sector. According to Morton (1997), leaders are people with the capacity to influence, direct and coordinate activities. ACAS (2010) asserts that change and progress in the teaching and learning of computers in schools requires on-going commitment and involvement of management to compliment the transformative teaching of computers. School administrators are the key change agents and their commitment guarantees continuous supply of human, material and time resources. Mndzebele (2013) argued that their commitment and involvement would help in cutting through the bureaucratic red tape that would have potentially been an obstacle. Webb (2010) suggests that unless and until the school leadership or administration is dedicated to change, nothing will succeed.

However, Morton (1997) and Brand (1998) concurred and suggested that school administrators need to be oriented on the implementation of the teaching and learning of computers in schools. Arzt, (1991) and Lockard

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et al (cited in Mann, 1997) recommended that school administrators needed to be inducted on the importance of teaching and learning of computers in schools. Persky (1999) (cited in Brand, 1998) also suggested that school administrators need to be philosophically developed in order to guide the implementation of the teaching and learning of computers in schools as well as offering support for the technological development of teachers.

RESEARCH METHODOLOGY

In examining factors hindering the teaching and learning of computers in secondary schools in the Chiwundura Cluster, a mixed-methods research approach was employed, incorporating both qualitative and quantitative data analysis techniques. Quantitative data were analyzed using statistical methods to identify trends and correlations among variables, such as resource availability and teacher qualifications, while qualitative findings were derived from interviews and focus groups, providing deeper insights into the contextual challenges faced by educators. As a way of countering potential biases stemming from respondents' subjective perceptions and unequal resource access across schools, the researcher utilized a random sampling method to ensure diverse representation and triangulated data with external evaluations or observations to provide a more balanced perspective on the challenges of computer education. The integration of these findings involved triangulating the data, where qualitative insights enriched the quantitative results, allowing for a more comprehensive understanding of the barriers to effective computer education in the selected schools. The researcher used the random probability sampling from a pool of four secondary schools to come up with participants. This sampling method ensures each school has an equal chance of being selected, promoting representativeness and minimizing selection bias (Creswell, 2014). Through random sampling, the study enhanced the validity of the findings, allowing for a more generalizable understanding of the issues affecting computer education within this specific context.

More so, through combining both quantitative and qualitative data collection methods, the research will utilize surveys to gather numerical data from teachers and students regarding their experiences and access to computer resources. Simultaneously, case study design facilitates an in-depth exploration of the selected schools through interviews and focus group discussions. According to Yin (2014), such case studies provide valuable insights into the complexities of educational settings, offering a comprehensive view of the factors influencing computer education. This mixed-methods approach not only captures the statistical trends in computer teaching and learning but also delves into the contextual factors, such as infrastructural challenges and professional development needs, providing a holistic view of the educational landscape in Chiwundura.

In this study, a combination of questionnaires, interviews, and observations was employed to investigate the factors hindering the teaching and learning of computers in four secondary schools, thus Tangwena secondary school, Chiwundura High School, St Patricks Secondary school and Gunde Secondary School within the Chiwundura Cluster in Gweru. The use of questionnaires allowed for the efficient collection of quantitative data teachers, facilitating the identification of trends regarding their access to technology and training (Creswell, 2014). Interviews with school heads and their deputies provided qualitative insights into their personal experiences and perceptions, revealing specific challenges, such as inadequate training and lack of resources (Yin, 2014). Furthermore, observations in classroom settings enabled the researcher to gain first-hand insights into instructional practices and the actual use of technology during lessons, identifying barriers that may not be apparent through self-reported data (Cohen et al., 2011). Through triangulation of these methods, the study aimed to generate a comprehensive understanding of the obstacles faced in computer education, ultimately leading to actionable strategies for improving teaching and learning in these schools.

FINDINGS AND DISCUSSIONS

Respondents' Demographic Data

The distribution of participants by gender is shown on Table 1 below:

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Gender	Frequency	Percentage
Males	8	40%
Females	12	60%
Total	20	100%

Table 1: Distribution of participants by gender.

The gender distribution shows a slight majority of female teachers (60%) compared to males (40%), reflecting a relatively balanced representation in the teaching workforce. This near-equal gender ratio may promote diverse perspectives in educational practices and policies. The implication of this distribution suggests that both genders are valued in the educational environment, which can enhance collaboration and create a more inclusive atmosphere for students.

Distribution of respondents by qualifications is shown on Table 2 below:

Qualification	Frequency	Percentage
Diploma	6	30%
Degree	10	50%
Masters	4	20%
Total	20	100%

Table 2: Distribution of respondents by qualifications.

The qualifications data reveals a predominantly well-educated teaching workforce, with 50% holding a Bachelor's degree, the largest single category. Additionally, 20% of the teachers possess a Master's degree, indicating a commitment to furthering their education and expertise. Conversely, those with only a Diploma make up 30% of the sample, suggesting a balanced representation of varying educational backgrounds among the participants. The diversity in qualifications may also foster a collaborative environment where experienced educators can mentor those with Diplomas, ultimately promoting professional development and improving the overall educational experience for students.

Distribution of respondents by years of teaching experience is shown in Table 3 as below:

Years of Teaching experience	Frequency	Percentage
0-5 years	5	25%
6-10 years	2	10%
11-15 years	5	25%
16 years and above	8	40%
Total	20	100%

Table 3: Distribution of respondents by years of teaching experience.

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The data indicates a diverse range of teaching experiences among the participants, with the largest group (40%) having over 16 years of experience, suggesting a predominance of seasoned educators. Conversely, the categories of 0-5 years and 11-15 years each account for 25%, while those with 6-10 years of experience are the least represented at 10%. The distribution indicates a potential wealth of experience within the teaching cohort, which could positively influence educational practices and mentorship opportunities.

The availability and utilization of computers for teaching and learning about computers as a curriculum subject in secondary schools within the Chiwundura cluster.

Name of School	Number of Computers	Ratio Against Learners	Evaluation
Tangwena Secondary School	0	-	Extremely Not Satisfactory
Chiwundura High School	15	1:43	Not Satisfactory
St Patricks High School	20	1:45	Not Satisfactory
Gunde High School	25	1:42	Not Satisfactory

Table 4.4 Availability of computers in secondary schools in Chiwundura

The data indicates a significant shortage of computers across the secondary schools in the Chiwundura cluster, particularly at Tangwena Secondary School, which has no computers available for teaching. This lack of resources may lead to teachers feeling discouraged or unwilling to teach the computer subject, as they may perceive the environment as inadequate for delivering effective instruction. Additionally, the limited student-to-computer ratios in Chiwundura High School, St. Patricks High School, and Gunde High School further complicate the ability for teachers to effectively engage students in hands-on learning experiences. Computer shortage in secondary schools in Chiwundura is therefore argued to be one of the contributory factors to the non-teaching and learning of computers in secondary schools in Chiwundura. The same factor was identified by Osin (1998) as one hindering the teaching of computers in Europe. Osin (1998) disappointingly observed that schools lacked appropriate infrastructure such as computers, particularly in rural areas where there are substandard classrooms, lack of telephones and laboratories.

Responses from Heads and Deputy Heads on Causes of Non-Teaching and Learning of Computers.

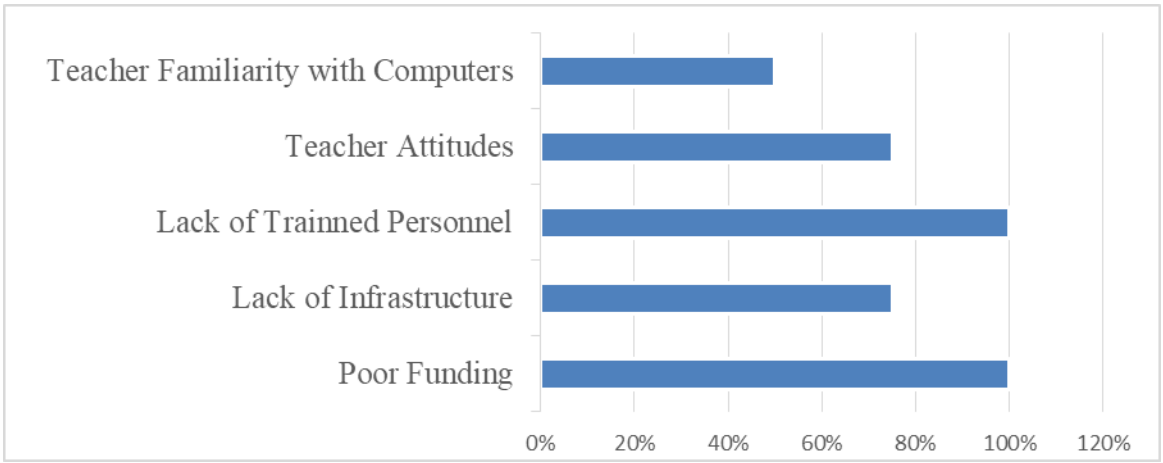


Figure 4.1: Responses from Heads and Deputy Heads on Causes of Non-Teaching and Learning of Computers.

Figure 4.1 above indicates that poor funding and lack of trained personnel are the most prominent barriers to technology integration in schools, each reaching 100%. This suggests that institutions struggle primarily with securing financial resources to procure and maintain ICT tools and with ensuring the availability of skilled

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staff capable of supporting digital learning. Such findings align with existing literature: according to Tondeur et al. (2017), inadequate funding directly limits hardware availability, software acquisition, and ongoing technical support, all of which are essential components of ICT implementation. Similarly, research by Buabeng-Andoh (2012) emphasizes that insufficiently trained personnel impede the effective use of digital tools, as teachers require both technical and pedagogical knowledge to integrate technology meaningfully into instruction. The moderately high levels of barriers related to lack of infrastructure (about 75%) and teacher attitudes (around 75%) further reinforce the idea that both structural limitations and perceptions toward technology shape the success of ICT adoption in educational settings.

Heads of schools and their deputies also said that the situation of non-teaching and learning of computers in schools was a resulted of not having trained personnel who are specifically trained to teach computer studies. These two problems were also echoed by Mndzebele (2013) in a research carried in Swaziland on computerization in schools. Besides, heads of schools and their deputies also indicated that teachers have a negative attitude in the teaching of computer studies. Heads of schools and their deputies also pointed out that in some schools most of the teachers were familiar with the use of computers although in some schools the situation was not encouraging.

The implication for practice is that addressing these barriers requires a multi-layered strategy that prioritizes investment in infrastructure, continuous professional development, and policy support. The relatively lower percentage for teacher familiarity with computers (around 50%) suggests that while familiarity is improving, significant gaps remain in teachers' confidence and competence, aligning with Mishra and Koehler's (2006) TPACK framework, which stresses the need for intertwined technological, pedagogical, and content knowledge. Improving teacher readiness through sustained training could positively influence attitudes, which Ertmer (1999) identifies as crucial "second-order barriers" that are harder to change than structural constraints. Thus, the findings imply that policymakers and school administrators should allocate funds strategically, enhance ICT infrastructure, and focus on capacity building to ensure equitable and effective technology integration in schools.

Figure 4.2: Responses from Teachers on Causes of Non-Teaching of Computers

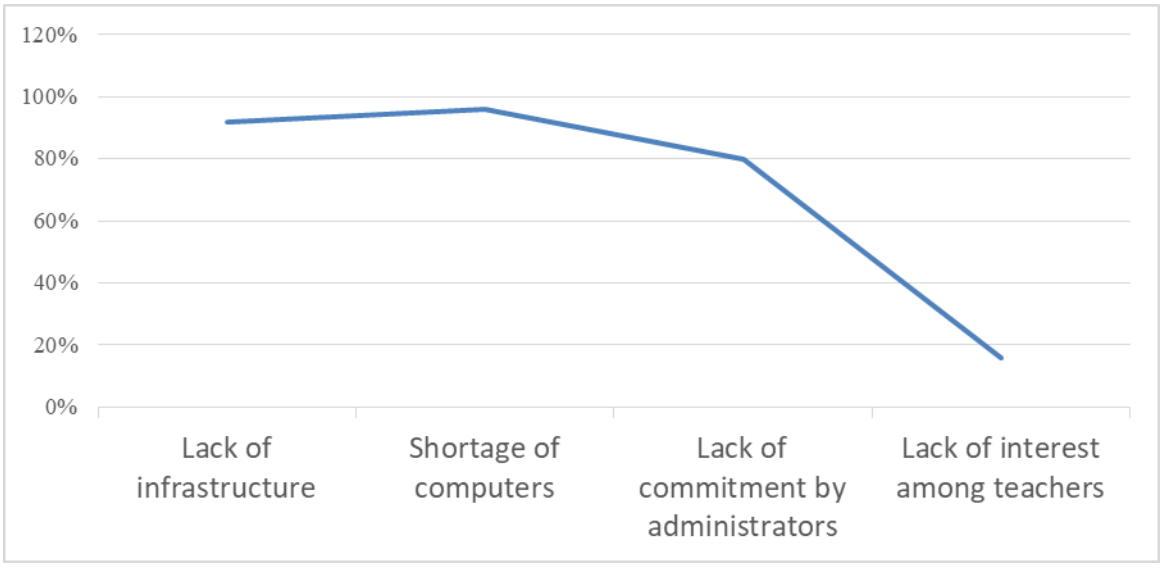


Figure 4.2 indicates that lack of infrastructure, shortage of computers, and inadequate commitment from administrators are significant barriers to ICT integration, each scoring between 80% and 97%. In contrast, lack of interest among teachers is much lower at about 15%. This pattern illustrates that structural and institutional challenges are more pronounced than motivational issues among teachers. These findings are consistent with existing literature, which identifies infrastructural deficiencies and limited hardware availability as primary obstacles to ICT adoption in schools, particularly in developing contexts (Tondeur et al., 2017; Hennessy et al., 2010).

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Administrative support is critical in shaping the implementation of ICT policies, resource allocation, and the overall vision for technology use in education (Ertmer & Ottenbreit-Leftwich, 2010). The low percentage reflecting teacher interest suggests that while there is some motivation, teachers remain constrained by external barriers beyond their control. Thus, meaningful ICT integration demands systemic investments in infrastructure and resources, alongside strong leadership commitment from school administrators.

Classroom observations indicated that many teachers struggled to effectively engage students due to a lack of resources and training. The observations were in line with Munthali (2004), who said that classrooms were equipped with out-dated equipment, and the absence of functional computers limited hands-on learning experiences. This situation was mirrored in the student performance data, where a correlation was evident between inadequate access to technology and low achievement levels in computer science. Students often expressed frustration over their limited ability to practice skills outside the classroom, which contributed to widespread computer illiteracy and a reluctance to pursue ICT-related studies.

Additionally, assessments of teacher competencies highlighted gaps in both foundational knowledge and pedagogical techniques necessary for effective computer instruction. As was reported by Kafela (2018), many teachers may feel unprepared to teach computer science due to insufficient professional development opportunities. From the observations, this lack of training not only affected teachers' instructional methods but also influenced their confidence levels, impacting student engagement further. The findings underscored the need for comprehensive teacher training programs and better infrastructure to create a conducive learning environment, emphasizing that addressing these issues is essential for improving the overall effectiveness of computer education in the region.

More so, several systemic challenges related to curriculum alignment, teacher training programs, and ICT policy implementation where observed and in was noted that they hinder effective computer instruction. As was noted by Mtebe & Raisamo (2014), the curriculum often lacks coherence with existing ICT policies, leading to disconnection between what is taught and available technological resources Furthermore, many teachers reported insufficient training on ICT integration and lack of continuous professional development opportunities, which diminishes their confidence in delivering computer education effectively (Musarurwa, 2011). The ICT policy implementation remains uneven, with urban schools often better equipped than rural counterparts, exacerbating disparities in educational quality (Mandoga et al., 2013). Moreover, the findings were in line with Lufuno (2013), who noted that. inadequate teacher training programs fail to address specific pedagogical techniques needed for effective ICT integration, leaving educators feeling unprepared. These findings suggest a pressing need for cohesive strategies that align curriculum, training, and policy frameworks to improve teachers' competencies and student outcomes in computer education.

Strategies for Curbing Non-Teaching and Learning of Computers

Respondents were asked to suggest strategies for mitigating the non-teaching and learning of computers in secondary schools in Chiwundura. They rated these strategies as not necessary, necessary, or extremely necessary.

Teacher Training

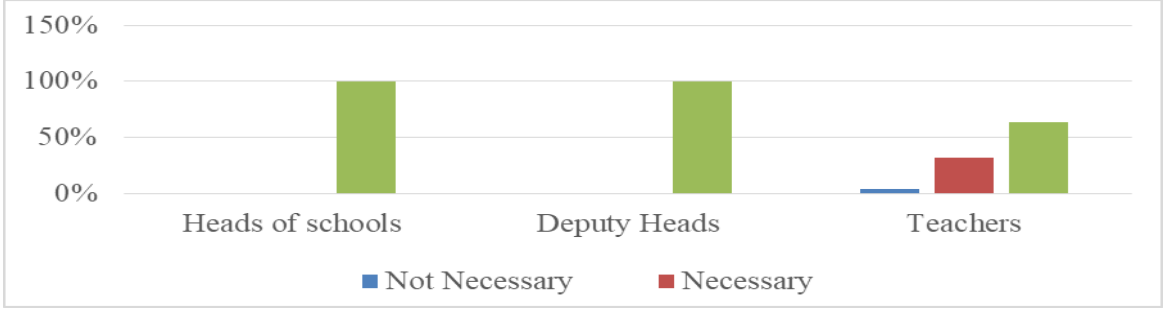


Figure 4.4 Responses on teacher training

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Figure 4.4 reflects that most respondents rated teacher training as a necessary strategy to address non-teaching and learning of computers. Handwritten comments from heads of schools, deputies, and teachers overwhelmingly emphasized a need for enhanced teacher training in computer education. This mirrors actions taken by the British government in 1966 to address a similar shortage of trained personnel for computer studies in schools (Merireng, 2013).

Development and Acquisition of Computer Infrastructure

Respondents from the four selected schools also highlighted the importance of developing computer infrastructure as a crucial step toward improving computer education in Chiwundura. Figure 4.5 below demonstrates the respondents' ratings regarding this need. Availability of hardware and software is essential for the effective adoption and integration of computer studies. In Swaziland, Mndzebele (2013) also identified acquisition of computer resources as a key strategy for enhancing educational outcomes.

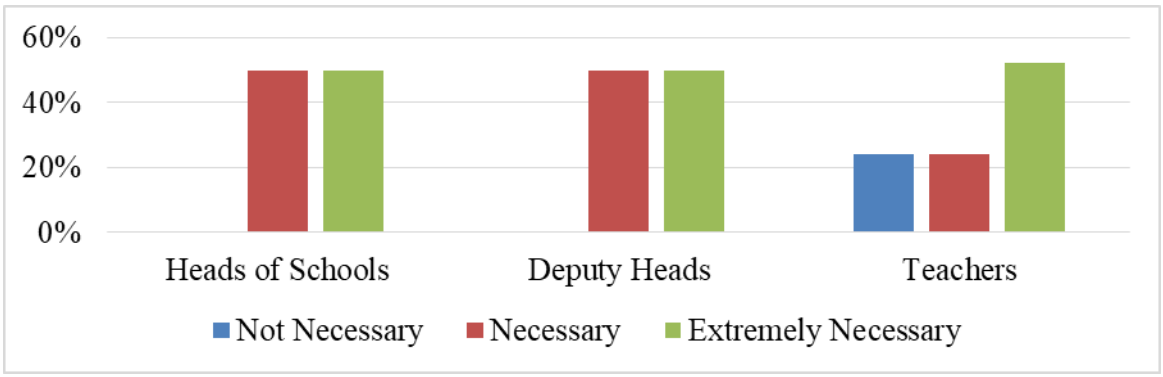


Figure 4.5 Responses on development and acquisition of computer infrastructure

Furthermore, the absence of proper rooms for housing computer equipment was noted as a challenge in many African schools. Webb (2010) contends that integrating computer studies requires constructing special facilities, which may be a financial burden.

Inclusion of Computerization Programs in National Budgets

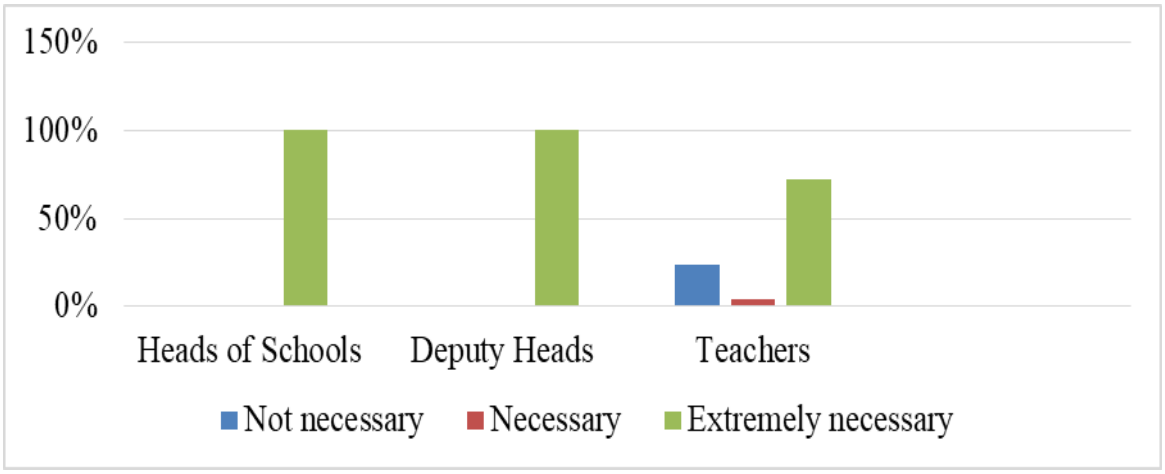


Figure 4.6 Responses on inclusion of schools computerisation programmes on national budgets

Figure 4.6 indicates strong support from heads of schools and their deputies for including school computerization programs in national budgets. This suggests an urgent need for the Zimbabwean government to prioritize funding for these initiatives. Research indicates that inadequate funding hampers progress in teaching and learning of computers within African educational systems (Mwalongo, 2011).

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Relaxation of Import Laws on Computer Hardware

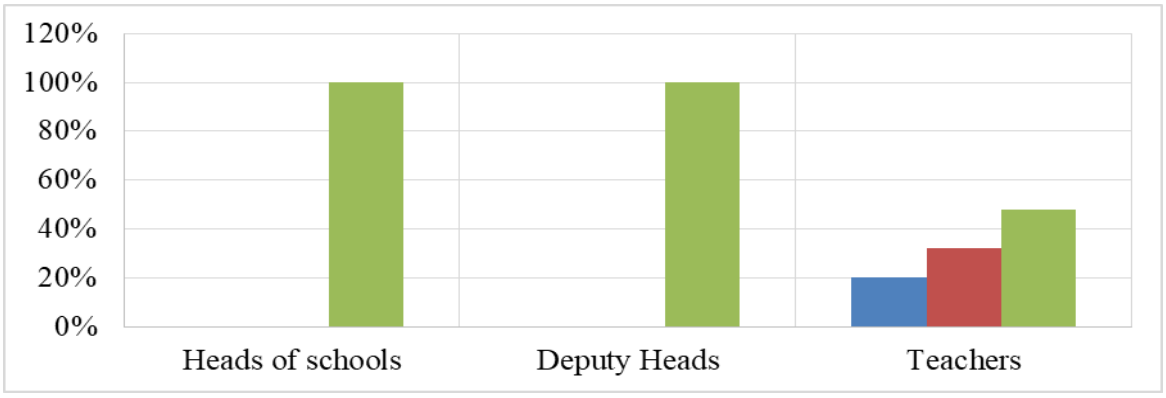


Figure 4.7 Responses on relaxation of import laws on computer hardware

Respondents also advocated for relaxing import laws on computer hardware, as acquiring equipment locally is often prohibitively expensive. Figure 4.7 presents their ratings regarding this suggestion, with overwhelming support for government action in this area. Mkandawire (2004) similarly urged for relaxing import restrictions to facilitate access to affordable computers for schools.

Introducing Electrification Programs in Schools

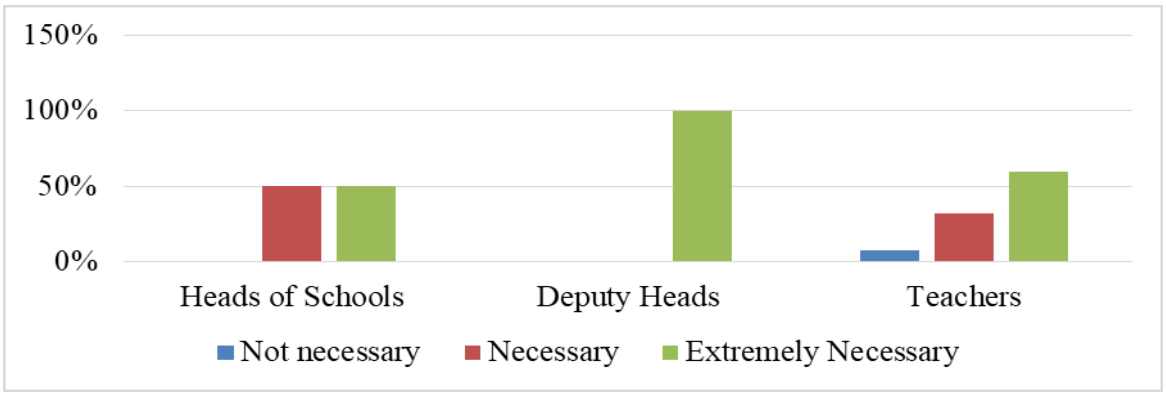


Figure 4.8 Responses on introducing electrification programme in schools

Figure 4.8 shows that many respondents believe the government should implement electrification programs, particularly for rural schools in Chiwundura. Most respondents indicated that these initiatives are vital for schools lacking electricity, enhancing the capacity for computer education. Musarurwa (2011) highlighted the widespread lack of electricity in rural schools, while Mndzebele (2013) pointed out that without electricity, the use of computers is unfeasible.

Training School Administrators on Computerization

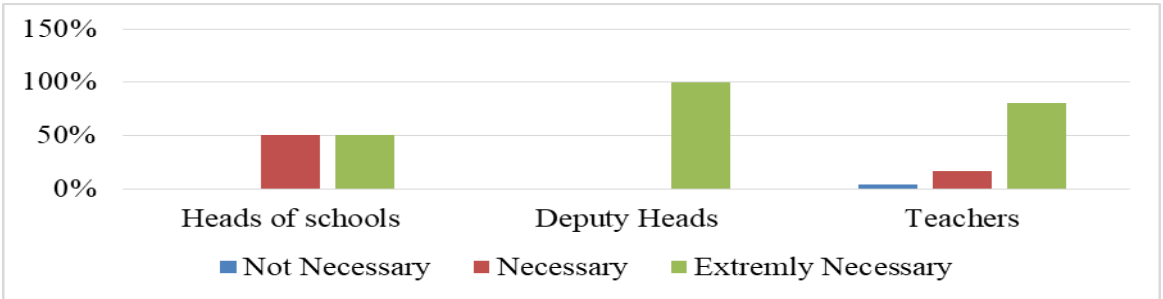


Figure 4.9 Training of school administrators on computerization in schools.

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The need for training school administrators on effectively implementing computer studies was also emphasized by respondents. Figure 4.9 reflects strong support for this strategy, aligning with Morton (1997), who noted that effective leadership is critical in educational settings. Mndzebele (2013) asserted that committed leadership is essential to overcome bureaucratic barriers, enabling successful technology integration.

RECOMMENDATIONS

The researcher made the following recommendations;

- The study recommended that the government should ensure that all the teacher training colleges and universities make it compulsory that all their students take computer studies as one of their major subjects.

- The study also recommended that the government should introduce the electrification programme in schools especially those in rural setups such as Chiwundura.

- Apart from that, the study recommended that the government of Zimbabwe should incorporate computerisation programmes when budgeting for other national activities since so that they can capacitate schools in the implementation of the teaching and learning of computers.

- Furthermore, the study recommended that administrator in secondary schools in Chiwundura should now priorities the implementation of the teaching and learning of computer studies when making their budgets, hence the need for the acquisition and development of computer infrastructure in their schools.

Recommendations for further study

Further study is recommended:

- To conduct similar research across all secondary schools in Chiwundura Cluster or even across Gweru to determine if the challenges are widespread or unique to the four schools studied

- To assess how curriculum design, teaching methods, and assessment strategies influence the effective teaching of computer studies in secondary schools.

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Authors Contributions

1. Developed the content of the study

2. Carried out data analysis and interpretation.

3. Contributed to the integration of educational theories

4. Contributed to enriching the content

5. Contributed in content development

Conflicts of Interest

There was no conflict of interest among the researchers

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There was no external sponsorship for the study