

# Assessing Readiness for Teaching and Learning Using Ict's in Zimbabwean Secondary Schools in Gweru District, Zimbabwe

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## Research Article

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## Abstract

The purpose of this research paper is to evaluate Zimbabwe's readiness to integrate ICTs in teaching and learning at secondary school level. Drawing on Suhail (2014) E-readiness Assessment Model for low bandwidth environment, this research paper evaluates Zimbabwe's readiness to integrate ICTs in secondary schools. A qualitative interpretative study employing questionnaires and semi structured interviews was used for this research. The target population was fourteen secondary schools in Gweru district focusing on school heads (n = 14) and teachers (n = 213) as participants. The sample was derived from six schools where six school heads (n = 6) and twenty-nine teachers (n = 29) were purposively selected. Research findings revealed that a range of ICTs which include mobile devices, general software and desktop computers were available in schools. However, few schools were connected to the internet and most schools did not have smart boards, printers, photocopiers and multimedia projectors. No school had facilities for student's email accounts while teachers email accounts were mostly unavailable in schools. Teachers lack computer skills qualifications though they are expected to use computers and to teach using computers. The research provides empirically grounded insights on how ICT is being integrated in Zimbabwean secondary schools. The research contributes to the body of knowledge in the field of ICT readiness in developing countries settings such as Zimbabwe. Consequently, insights gained from this research can assist in the design and development of strategies, interventions as well as policies to guide the integration of ICT in schools

## 1. Introduction

ICTs are widely considered to be a crucial input factor in the education sector for industrialization and development of Least Developed Countries (LDCs). During the last two decades, technological progress has accelerated with the spread of new ICTs (Duan et al., 2020). In this case, ICTs include computers, the Internet, and electronic delivery systems such as radios, televisions, and projectors among others. These are also widely used in today's education field (Fu, 2013). In many countries, ICTs have had a significant impact on education (Duan et al., 2020). Current research indicates that ICTs assist in transforming the teaching environment into a learner-centred one (Majola, 2020). The demand for ICTs in education has been increased by the recent outbreak of Covid 19 which now demands online teaching and learning. Considering the centrality of education in many societies including LDCs, school is the appropriate place to develop crucial ICT competencies (Li et al., 2019). However, in most African countries, most schools are in the early phase of adopting ICTs (Ezumah, 2020). ICTs adoption in Africa is characterised by patchy uncoordinated provision and use, some enhancement of the learning process, some development of e-learning, however, no significant progress in learning and teaching process (Matthew and Kazaure, 2020). Consequently, it is important for educational decision-makers to regularly assess the level of readiness for teaching and learning with ICTs through an assessment of ICTs integration into educational practice (Albion et al., 2015). Thus, ICTs in education can no longer be considered as luxury but a priority for three reasons. Firstly, it has gained traction in terms of its use across the education system (Sharma, 2015, Das, 2019). Secondly online teaching and learning has become a reality on account of the outbreak of the global pandemic, Covid 19. Thirdly, digital literacy is one of the cross-cutting themes in Zimbabwe's competence-based curriculum (Ministry of Primary and Secondary Education, 2015). Assessing the readiness of secondary schools to use ICTs in teaching and learning provides societies in least developed countries such as Zimbabwe with a strategic starting point for identifying what techniques can be used to make effective use of ICTs in education. In several countries, investment in ICTs in education is justified by the need for economic and social progress. However, the link between national development goals and ICT-enabled education reform is generally more rhetorical than practical (Kozma, 2005). Several factors have hindered the widespread use of ICTs in schools. Lack of resources to support ICT acquisition, lack of training for experienced teachers, lack of motivation, and the need for teachers to use ICTs as teaching tool are some of the factors (Ezumah, 2020). ICTs in schools should lead to important pedagogical and educational effects that benefit both students and teachers, according to policy makers around the world. (Fernández-Gutiérrez et al., 2020, Butler et al., 2018). Academic studies have revealed that ICT in education improves student motivation and understanding and promotes active collaboration and lifelong learning (Ezumah, 2020). They can also help students to think and communicate creatively by providing shared work resources and better access to information (Majola, 2020, Sharma, 2015). As a result, schools around the world are realising the importance of incorporating ICTs into their daily operations to achieve their intended goals. In order to evaluate the degree of readiness for teaching and learning as determined by the extent of integration of ICTs in selected Zimbabwean secondary schools from Gweru district. Following this introduction is a theoretical framework underpinning this study, followed by a third section focusing on literature review on ICTs and the Zimbabwean context. Section four presents the research methodology. The key results and discussion constitute fifth section followed by the conclusion and recommendations of the study as the last section. In the next section, we draw on Suhail (2014) to propose a useful assessment framework for evaluating the level of readiness for teaching and learning in secondary schools based on the level of ICTs integration.

### E-readiness Assessment framework

Suhail (2014) considers E-readiness as the ability or capacity of an organisation and its related stakeholders involved in some e-learning experience to undertake or operationalise a learning program using ICTs. According to this definition, an E-readiness assessment examines the ability of an organisation and its stakeholders to adopt and use ICTs. (Suhail, 2014). As mentioned earlier, assessing e-readiness in the context of LDCs is important because there are several barriers that can prevent successful ICT integration in schools. High technological costs, inefficient or non-existent bandwidth management strategies and poor management of the few institutional resources available are among these barriers. The E-readiness assessment would lead to real planning, according to the E-readiness assessment framework, and can be viewed as a starting point for establishing a coherent, strategy tailored to the needs of the beneficiaries. E-readiness consists of several dimensions, such as availability of technical infrastructure such as availability of bandwidth, its cost, speed and strategies), human resources, e-learning in initiatives, legal issues, perceptions and attitudes of teachers and learners towards the adoption of technology-enhanced pedagogy. Whilst the notion of e-readiness assessment has been extensively explored in several academic studies, the framework has hardly been applied as an assessment or explanatory model. (Irfan et al., 2018, Bhaumik and Priyadarshini, 2020, Irene and Zuva, 2018). Consequently, it is critical that the e-readiness assessment model is chosen for this study because it does not advocate for assessment for its own sake; rather it lays the foundation for designing strategies which addresses issues in the readiness assessment of educational institutions across the country. Secondly it is a multi-dimensional framework which is open ended thereby giving space for a clear understanding and evaluation of a context specific level of readiness for teaching and

learning using ICTs. Against this background, this paper will examine the extent to which secondary schools in Zimbabwe, an LDC, are ready to introduce blended e-learning. In the next section, we discuss ICTs in the Zimbabwean context.

## 2. Icts And The Zimbabwean Education Context

The government of Zimbabwe through the Ministry of Primary and Secondary Education is making efforts to integrate ICTs into the teaching and learning process. The intensive use of ICTs for teaching and learning in educational institutions was recommended by the Nziramasanga (1999) which was set up to inquire into the Education and Training System of Zimbabwe. However, teachers in Zimbabwe face challenges in operationalizing ICTs in their everyday pedagogical practices due to several factors which will be explained later in the paper (Mandina, 2015). Zimbabwe is one of the African countries that has a dedicated national ICT policy which was adopted in 2016 (Minister of Information Communication Technology and Courier Services, 2016). The policy makes reference to the promotion of ICTs in education including pedagogical use (Musarurwa, 2011, Isaacs, 2007). Zimbabwe's ICT policy vision, which remain unfulfilled and subsequently overtaken by vision 2030, was to transform the country into a knowledge-based society by 2020. The goal was to accelerate the development and application of ICTs in support of economic growth and development (Mandina, 2015). The policy's objectives are to promote the development of ICT infrastructure and to provide education and training programmes for production of knowledge workers and qualified human resources. Other objectives are, to establish relevant structures and institutional mechanisms to promote ICTs, as well as to encourage equitable access of ICTs across gender, youths, the elderly, and people with disabilities (Isaacs, 2007). The National ICT policy also makes significant references to the promotion of ICTs in education including their pedagogical use in educational institutions. Moreover, most schools were provided with computers by the former president of Zimbabwe Robert Gabriel Mugabe. This resulted in most schools both in the urban and in the remote areas of the country benefitting. In addition, this enabled them to utilise ICTs in the teaching and learning process. Consequently, this means that the Government of Zimbabwe and the Ministry of Primary and Secondary Education is convinced that ICTs can be used to transform its education system should they be integrated effectively. However, lack of a clear and dedicated body that specifically deals with ICTs in Education in Zimbabwe has been hindering the government's noble objectives. These hindrances will continue to be a stumbling block, if not decisively addressed. Despite government efforts, it is still apparent that most schools have not yet effectively adapted and integrated ICTs in their teaching and learning. Thus, the aim of this research paper is to evaluate Zimbabwe's readiness to integrate ICTs in teaching and learning at secondary school level. The next section provides an outline of research methods used to generate data informing this paper.

## 3. Methodology

The overarching aim of this study was to establish the degree of readiness for teaching and learning using ICTs in secondary schools in Zimbabwe focusing on multiple cases from Gweru district. Gweru district was chosen as a microcosm of the schools in Zimbabwe as it consists of both rural and urban schools. In addition, Gweru is a provincial capital of equal status to most of the 10 provinces of Zimbabwe serve for the capital, Harare. Thus, a study that seeks to analyse the level of readiness for the use of ICTs in secondary schools in Zimbabwe using multiple cases from Gweru district is deliberate and strategic. The data was collected during the six months period preceding the outbreak of Covid 19. This research was undertaken after undergoing an ethical clearance by the faculty and university ethical board (EDUSTA001/21). Informed consent was sought from the voluntary participants and we guaranteed privacy and confidentiality. To ensure this we used pseudonyms to identify participants and research were not identified by name.

A qualitative interpretative study employing questionnaires and semi structured interviews was used for this research. The target population for this study was fourteen secondary schools in Gweru district drawing on experiences and perceptions from teachers (n = 213) and school heads (n = 14). A sample of six secondary schools was purposively selected. To ensure that all school categories which offer secondary education in the district were represented, the researchers compiled three lists, one of the private schools the other one for government secondary schools and one for government high schools in Gweru district. Private schools are generally thought to be well endowed in terms of resources than government-owned schools. On the other hand, high schools offer Advance level studies and are generally better resourced than secondary schools, which only offer courses up to Ordinary level. According to Bryman (2016) this type of purposive sampling is called multi-stage cluster sampling, since it involves clustering primary sampling units by groupings/categories (e.g. by responsible authority); then within those categories (e.g. highest level of study offered by the school) as different clusters. In this case as already pronounced above, high schools offer up to Advanced level studies, while secondary schools offer up to Ordinary level studies. This is necessary since there is a need to study more than one secondary school category, not necessarily for comparative reasons, but to allow for a broad understanding involving a range of different actors. The various responsible authorities running the schools (government, and private) highlights the fact that they are different. The cases also provide distinctive characteristics that illuminate different aspects in research questions. Their varying characteristics are highlighted only for the purposes of addressing research questions. Table 1 shows the number of questionnaires and interviews that were administered.

Table 1  
Showing the number of questionnaires and interviews purposively sampled.

Target Groups	Population Size	Sample Size	Percentage
School Heads	14	6 ( <i>Interviews</i> )	42.8%
Teachers	213	29 ( <i>Questionnaires</i> )	13.6%
<b>Total</b>	227	35 ( <i>Both</i> )	15.4%

A total number of 35 participants were selected. The categories as mentioned earlier are school heads and teachers. Questionnaires and face to face interviews were administered to different schools to ensure that all the selected schools and strata were represented in the survey. Each interview lasted for an average of an hour. Questionnaires were administered after getting informed consent from each teacher on the first visit of the researchers to each school but were collected after one week. For practical reasons, it was not possible to include all teachers in the district in the study. A sample size of 29 teachers for

questionnaires, which was approximately, 13.6% of the teachers' population of 213 was satisfactory. Six school heads out of fourteen (42.8%) were used as a sample for interviews. Two methods of generating data used in the study were effective and provided enough empirical evidence for an assessment of the degree of readiness for teaching and learning using ICTs. Therefore, the total sample for this study was 35 which is approximately 15.4% of the population. This is in line with Mugenda and Mugenda (2010) who says that at least 10% of the population must be used as a sample. In the study, the gender composition was 19 males and 16 female teachers including school heads which were proportionate to the number of male and female teachers in the district. Table 2 shows the distribution of the research instruments by schools.

Table 2  
Showing the distribution of questionnaires by schools. (N = 35)

School Type	Number of questionnaires distributed, and interviews conducted.	
	School Heads (Interviews)	Teachers (Questionnaires)
Private Schools	2	11
Government High Schools	3	13
Government Secondary Schools	1	5

As illustrated in Table 2, face to face interviews were administered to 6 school heads while questionnaires were administered to 29 teachers from the three school categories. In order to enable easy analysis, storage and management of data a scheme was developed. All respondents were labelled according to their categories. All the six schools were each assigned a letter of the alphabet from A to F. All responses from Private Schools were labelled with a letter P, those from Government High School with a later G and those from Government Secondary School was labelled S. In addition, the prefix T was used to label responses from teachers while H was used to label school heads. In addition, a numerical number was assigned to act as a unique identifier for each respondent. Participants were labelled numerically, starting with 1, as the completed questionnaires were received. The pseudonym for each respondent was used to protect their identity, as well as an aid in the storage of data. The following section discusses the results of this study.

## 4. Results

The study targeted 29 teachers and 6 school heads in collecting data concerning readiness for teaching and learning using ICTs in selected secondary schools from Gweru district in Zimbabwe. All teachers (29) completed and returned their questionnaires, and all the 6 school heads were successfully interviewed making a response rate of 100%. Data was presented using tables and pie charts. The analysis was informed by the E-readiness model which was simultaneously guided by research questions for the study but done using the thematic approach. Consequently, results are presented using five themes which are ICT facilities found at each school, essential human resources employed at each school, and computer related qualifications held by the teacher participants, uses of computers at each school as well as strategies suggested to facilitate effective and efficient ICT integration. The next section discusses the analysis for the first theme.

### ICT facilities available in schools

The first theme presents and explains ICT facilities that are available in a particular school. Participants were required to tick from a list of the facilities that were provided and were further given an instruction to indicate any other facilities that they felt were necessary but not indicated on the list. Selected teacher participants were asked to indicate the availability of different facilities in their schools. Table 3 shows participants' responses with regards to the availability of ICT facilities in schools.

Table 3  
Showing participants responses with regards to ICT facilities that are available in schools. (N = 29)

Facility	Participants																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Mobile Devices	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x		x	x	x		x	x	x	x
SmartBoard	x		x			x		x				x				x							x		
Teacher email account	x		x	x		x		x		x		x	x				x			x	x		x		
Student email account																									
General software		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Communication software					x																				x
Digital camera				x			x		x		x		x	x				x			x	x		x	
Digital Photocopier	x		x					x																	
Multimedia projector	x		x					x												x	x		x		
Internet connectivity	x		x			x		x		x			x	x				x	x		x	x		x	
Desktop computer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Laptop computer	x		x					x				x								x	x		x		
Pinter	x		x		x			x		x					x				x				x		
WIFI	x		x			x		x		x	x	x			x					x	x		x		
Wired network					x									x											
Interactive Boards	x																								

Following the current section, is a discussion on the second theme, ICT support staff in selected secondary schools. In this case support staff include laboratory technicians.

### ICT support staff in selected secondary schools

The second theme emerged as a response to a question which sought to find out if there are lab technicians in secondary schools. Selected teacher participants were asked to indicate the availability of lab technicians and other ICT support staff in their school. Teacher participants were further required to explain how ICTs at their schools are maintained and how their network was supported if they had indicated that they did not have any ICT support technicians in their school. The frequency for the questionnaire responses for this research question is illustrated in Fig. 1.

As shown in Fig. 1, 10 out of 29 teachers (34.4%) indicated that there were ICT support staff available at their schools while 19 out of 29 (65.5%) indicated that there was no ICT support staff at their schools. When asked how they maintain their computers and support their networks (those who indicated availability of a network), the teachers indicated that they rely on outsourcing computer maintenance services and rely on internet service providers for network support. This was supported by a respondent, FST3 who said "Our school has a huge problem. The school does not employ a technician to fix our computers and support our school network. On the other hand, we have to outsource such services at a huge cost. In addition, we rely on Internet service providers for internet support related issues." This is in contrast with (Mutisya et al., 2017, Gosper et al., 2007) who argues that technical staff are very critical in supporting the integration of ICT in schools for teaching and learning. However, the schools that did not have technicians indicated that they did not have the financial capacity to employ ICT support staff. This was illustrated by a respondent who said "If the government is failing to employ adequate teachers, do you think it will be able to employ technicians, due to the current budgetary constraints" EGH2.

This showed that few schools from the sample had ICT support staff who support their networks and offer technical services for their ICTs. This is an indicator that the degree of preparedness for teaching and learning using ICTs in these schools is low. Closely related to this theme is the issue of appropriate qualifications held by teacher participants which will be presented next. These are qualifications related to the teaching of computers or a qualification showing a deep understanding of the subject area.

### Participants' computer qualifications

Participants were also required to indicate their computer qualifications. Participants were presented with the following qualifications: ICDL, Certificate, Diploma, Higher National Diploma, Undergraduate Degree and Master's degree. Participants were further required to indicate whether they had ever attended a computer skills workshop and to indicate if they were willing to attend any if they have never attended one. Figure 2 illustrates the responses with regards to the teacher's computer qualifications.

As shown from Fig. 2, out of the 29, two teachers (7%) indicated that they had done an ICDL course while 4 out of the 29 teachers (14%) indicated that they were HEXCO certificate holders. Furthermore, 2 out of 29 teachers (7%) were holders of a Bachelor of Computer Science degree while 2 others (7%) indicated that they were holders of a diploma from a local polytechnical college. There were no holders of HND and master's degree. Thus only 10 teachers out of the 29 had at least a computer qualification and a greater number of the teacher participants did not have any computer qualification. When the teachers were asked if they had ever attended a computer skills training, 12 out of 29 teachers indicated that they had once attended. However, they indicated that they were not provided with enough time to use the computers since there was a limited number of computers at the training venues. Respondent DGT5 remarked, *"I once attended a computer training organised by the Ministry of Education two years ago, it's unfortunate that we did not do much hands on as we were many and had very few computers available yet the training was for only one day"*. Again, when the teachers were asked if they were willing to attend training, all teachers indicated that they were willing to attend a computer skills training. Some indicated that they were even willing to pay some tuition for the training if there was a need for them to do so. This was illustrated by a comment *"Education is changing, computers are becoming important than before you cannot do without knowledge of computers, I am willing to attend computer courses, even it means paying for myself."* (EGT2).

These results reveal that there is an apparent skills gap hindering the successful integration of ICT. This may mean that either there is no commitment to bridge the skills gap or lack of understanding in the responsible officers who are supposed to spearhead ICT integration in schools. Furthermore, it may also be given that the responsible authorities do not understand the importance of ICT integration in schools hence the skills gap will remain if nothing is done. Thus, this is in contrast with Kalogiannakis (2010) who states that those who implement ICT should have a thorough understanding of ICT.

Out of the six school heads, none of them had the least qualification that was indicated on the questionnaire. All the six heads had no computer qualifications. Thus, these results indicate that teachers who are expected to use ICT for teaching and learning may not have proper supervision since the school heads lack a proper understanding of ICT skills. Poor administrative support is also highlighted by Bogler (2015) as a barrier to the successful integration of ICT in schools. The following section is a discussion on the results for purposes of computers in schools.

#### **Purposes for which ICTs are used in schools**

The fourth question required the participants to indicate the purposes for which ICTs are used at their schools. Participants were asked to indicate even more than one purpose as applicable. Some of the purposes were provided on the questionnaire, but participants were asked to add any other purposes that might have been omitted by the researchers. Table 4 shows the participants responses with regards to the purpose for which ICTs are used at their schools.

Table 4  
Showing the different purposes for which computers are used in secondary schools. (N = 29)

Purpose	Participants																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Research	x				x	x	x																		
Communication		x	x	x	x		x					X	x	x	x		x		x	x	x				x
E-learning	x						x	X		x		X					x								x
Administrative purposes	x	x	x	x		x	x	X	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x
Teaching and Learning	x	x		x				X			x			x			x			x			x		x
Examinations Marking	x															x	x								x
Email	x			x		x		X		x		X			x		x				x		x		x
Chat	x		x	x	x	x	x		x	x		X	x	x	x	x	x	x	x	x	x	x	x	x	x
Download Music	x			x	x	x	x	X	x	x			x	x	x		x			x	x	x			x
Play games	x	x	x	x	x	x		X	x		x	X	x		x	x		x		x	x	x	x	x	x
Surf the internet	x		x			x		X		x		X	x			x	x		x	x			x		
Use educational software			x									X							x						x
Write computer programs								x										x							
Creating multimedia	x											X					x							x	x
Creating Databases	x					x						X			x					x		x	x		
Collaborative projects	x		x	x		x				x		X					x								x
Telecollaboration	x																								

As shown in Table 4, major uses of computers in selected schools included administrative purposes, chats, games and downloading audio and video files. Despite their critical role for teaching and learning, tele-collaborative learning, research, eLearning and creating multimedia lagged behind in the hierarchy of uses of computers as explained in the following section.

Interview results indicated that school heads used computers for administrative purposes, email, chat, downloading audio and video files as well as surfing the internet. This was illustrated by CSH1's comment *"Generally, we use computers to obtain and manage information especially for administration particularly for record keeping and browsing the internet, sending emails, chatting, downloading videos and other files"*. One of the school heads also indicated that he used computers to play games during his spare time. *"My daughter, to be honest with you, I use computer in my office to play FIFA and playcards when not busy"* (EGH1).

However, the use of computers for administrative purposes was the most common response given by the interviewees while playing games was the least common. Both the questionnaire and interview results indicated that computers in schools were used more for administrative purposes than for teaching and learning. Chatting and downloading audio and video files were the other common uses that were indicated. Most uses to do with teaching and learning were still not common among sampled teachers. These results agree with the findings of Barros and Lazarek (2018) who asserts that the use of ICTs in schools are mostly non-academic. This may have indicated that the authorities who push for ICT integration lack policies that clearly state the purposes of ICT integration in schools. Again, this may also create some risks that are associated with the misuse of ICT in schools. The results obtained also agree with the opinion of Tomczyk (2019) who state that teachers are less confident when it comes to using ICT to promote the development of more complex teaching and learning processes. In the next section, strategies for that can be used to facilitate efficient and effective ICT integration are discussed.

**Strategies to facilitate efficient and effective ICT integration**

The fifth question required the participants to suggest the strategies that they think can be used to facilitate efficient and effective ICT integration in secondary schools. Table 5 below shows the different strategies that were proposed by the participants.

Table 5

Showing participants views on how computer readiness in schools can be improved. (N = 29)

Recommendation	Frequency	Percentage
Introducing ICT as a compulsory subject.	25	86
Allow teachers and learners to use computers for other subjects	27	93
Negotiating for low tariffs from Internet Service Providers	26	90
Getting financial support for acquiring ICTs from the government	28	97
Teacher computer training skills	29	100
Mandatory use of electronic learning	22	76
The government should subsidize internet services in schools	26	90
Every teacher must have a minimum computer qualification	25	86
Regular workshops on computer training	29	100
Rewarding teachers and learners for using computers	29	100
The government should allow study leave for teachers to study ICT	29	100
Monthly computer skills staff development workshop	29	100
Need for a special loan for teachers to buy laptops and other ICTs	29	100

From the results shown in Table 5, teacher computer training skills, regular workshops on computer training, rewarding teachers and learners for using computers topped the recommendations suggested by participants. Other major recommendations were that the government should allow study leave for teachers to study, the need for ICT monthly computer skills development through staff development workshops and the need for a special loan for teachers to buy laptops and other ICTs. However, sampled teachers also acknowledged that there is a need for a mandatory use of ICTs in teaching and learning whilst the education authorities should continue negotiating for low tariffs from internet service providers as well as financial support from the government.

Interview results indicated that there is a need for compulsory use of computers by teachers when teaching. This was summarised by FDT3 who commented *"I would suggest that the government make it compulsory for teachers to use computers in classrooms and subsidize internet services. Internet services are quite expensive and unfordable for rural schools like ours"*.

APH1 also indicated that teachers need training and that the government should subsidize internet services in schools. *"Without government financial assistance and support computerisation can not succeed in rural schools. In addition, government should consider funding workshops, trainings and subsidies internet"*.

Heads also recommended regular workshops on computer training and that the government should give financial assistance to schools to build their ICT capacity. They also indicated that it should be mandatory to use electronic learning and other electronic resources for teaching and learning. These results are in line with recommendations from Alhawiti (2013) on strategies for integrating ICT into schools. Thus, the interview results and questionnaire results agree to the same needs that should be affected to allow the proper use of ICTs in schools. There is a dissonance between the recommendations that were provided by the participants and what is currently prevailing in terms of ICT integration, this may, however, indicate that teachers are not involved in decision making which may be critical for successful ICT integration in schools. Thus, for ICT integration to be successful, there is a need for the involvement of everyone (Mutisya, Mwanja, & Mulwa 2017). The following section is a discussion of the findings.

## 6. Discussion

Research findings revealed that mobile devices, general software and desktop computers are available in schools. However, few schools are connected to the internet and most schools do not have smart boards, printers, photocopiers and multimedia projectors. Furthermore, few schools have communication software and digital photocopiers, no school has facilities for students' email accounts. With few teachers email accounts and a limited number of wired networks and interactive boards, we can conclude that some of the necessary ICTs key to teaching and learning are already available in some schools. Nonetheless, as argued by Li et al. (2019) more should be done to improve the effective and efficient integration of ICTs in secondary school education. Thus, it can be concluded that the degree of readiness for secondary schools to integrate ICT in their teaching and learning is largely limited.

It also emerged that, against the advice of Singh and Chan (2014), a few schools were operating with ICT support staff, the majority of schools do not have this staff as they rely on outsourcing for maintenance and support.

The findings also revealed that teachers lack basic computer skills and qualifications though they are expected to use computers and to teach using computers. Only a few teachers are holders of computer qualifications while all the school heads indicated that they did not have any computer qualification. As such, it can be concluded that the degree of readiness among secondary schools to integrate ICTs in their schools for teaching and learning is still low. Nyamekye et al. (2021) says for ICTs integration to be effective and efficient, schools need teachers to have at least a minimum qualification that can allow them to be able to use ICTs properly.

It was also noted that computers in schools are mostly used for administrative purposes, chats, downloading audio and video files not related to work, playing games and for communication. However, eLearning, tele-collaborative learning, research, use of multimedia, educational software, examinations marking and computer programming as well as database creations which are key to teaching and learning were being used though minimally. Thus, it can be concluded that schools are less prepared to integrate ICTs for their teaching and learning. Tsai (2019) asserts that research, eLearning, tele-collaboration and the use of multimedia are key indicators of ICT integration readiness in schools. Thus, without these, schools cannot be considered ready for the integration of ICT.

It was also demonstrated that teachers were willing to contribute meaningfully to the integration of ICT in teaching and learning. This they said could be achieved through in-service training for teachers to acquire and further develop their computer skills. They also revealed that this could be augmented by rewarding them for the use of ICTs in their daily classroom practice. Schools are also willing to spearhead the integration of ICTs for teaching and learning but lack financial capacity. They appealed to the government to avail financial assistance and subsidise tariffs charged by internet service providers. From these findings, the next section discusses the recommendations that can be useful to improve readiness for teaching and learning using ICTs in a LDC setting.

## 7. Recommendations

The following recommendations were made on the basis of practical challenges and opportunities available;

- The government through the Ministry of primary and secondary schools can assist in the building of ICT infrastructure and the provision of ICT infrastructure and gadgets to facilitate the readiness for the integration of ICT in secondary schools.
- ICT competency standards for teachers should be set up which provide guidelines for planning teacher staff development programmes. Training needs to be analysed so that teachers are prepared to play an essential role in producing ICT capable students.
- The government can also provide internet connectivity to all secondary schools to enable the integration of ICT for teaching and learning.
- The Ministry of primary and secondary schools can also introduce ICT as a compulsory subject that is taken by any enrolled secondary school learner in Zimbabwean secondary schools.
- Teacher education institutions should spearhead ICT initiatives through training teachers to equip them with the requisite skills and knowledge to prepare them for classroom instruction.
- The Government of Zimbabwe should subsidize the connectivity tariffs for schools to enable readiness for the integration of ICTs in secondary schools.
- It is also recommended that all secondary school teachers be trained on the basic computer skills to avoid technophobia which is a hindrance to the readiness in the integration of ICTs.
- It is further recommended that teachers and learners be rewarded for effective integration of ICTs in their teaching and learning process.
- Finally, it must be mandatory for schools to use electronic learning. This will make it easy for the schools to be ready to integrate ICT since it will be a burden for each stakeholder to learn how to use the related ICTs
- A clear and compulsory national ICT education policy should be drafted to drive ICT integration in schools so that teachers and learners will be able to use computers in teaching and learning process.

### Conclusion

In conclusion, this research shows that readiness for teaching and learning using ICTs in Zimbabwean secondary schools in Gweru district is still at embryonal stage. Consequently, the research demonstrates that in the absence of clear-cut policies for ICT integration, there is danger of inconsistencies in the way ICTs are embedded in various teaching and learning contexts. As a result, the quality of teaching and learning may be negatively impacted. In addition, the research provides empirically grounded insights on how ICT is being integrated in Zimbabwean secondary schools. Furthermore, the research is also important since it can guide the integration of ICT in schools that are in similar environments. The research contributes to the body of knowledge in the field of ICT readiness in developing countries settings such as Zimbabwe. Hence, developing countries and comparable countries should strategically position themselves to fully integrate ICTs in their teaching and learning to take advantage of immense benefits brought by the use of ICTs in the education sector. Consequently, insights gained from this research can assist in the design and development of strategies, interventions as well as policies to guide the integration of ICT in schools. However, since the study was only limited to secondary schools in one district, the results cannot be generalized to other schools in Zimbabwe. Thus, there is a need for further studies. Further studies can expand the scope of the study to include other secondary schools within Zimbabwe.

## Declarations

- **Ethics Statement**
- **Acknowledgments.**

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- **Competing interests.**

The authors declare that they have no competing interests.

- **Funding.**

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- **Author contributions.**

All authors read and approved the final manuscript.

- **Availability of data and materials.**

All data generated or analysed during this study are included in this published article

\* Research involving human participants and/or animals

All procedures required by the were followed. Prior to carrying out research permission. Only teachers who consented to participation were included in this research. The participants were informed about the purpose of this research and participated on their own will. All the relevant information was provided with relevant information and possible dangers were disclosed to participants.

This research was undertaken after undergoing an ethical clearance by the faculty and university ethical board (EDUSTA001/21). Informed consent was sought from the voluntary participants and we guaranteed privacy and confidentiality. To ensure this we used pseudonyms to identify participants and research were not identified by name.

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## Figures

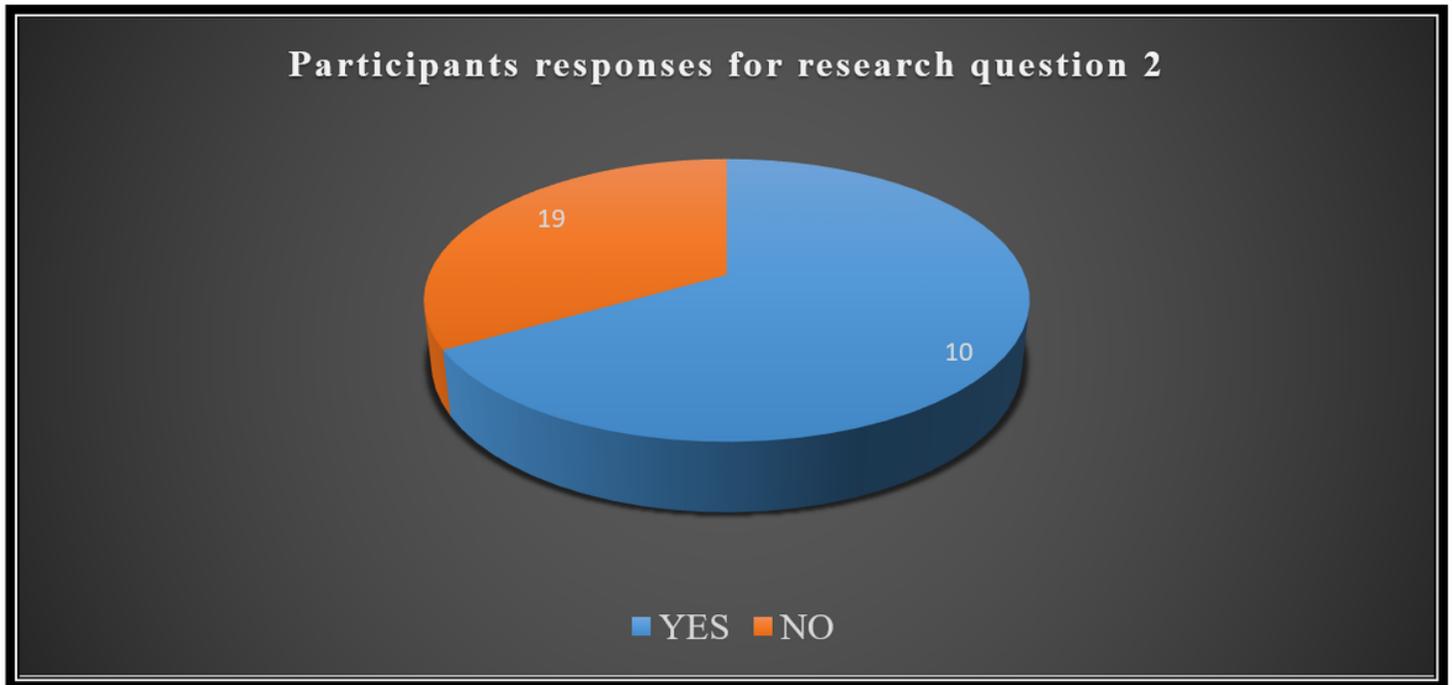


Figure 1

Availability of ICT support staff in schools (N=29)

## Participants responses for research question 2

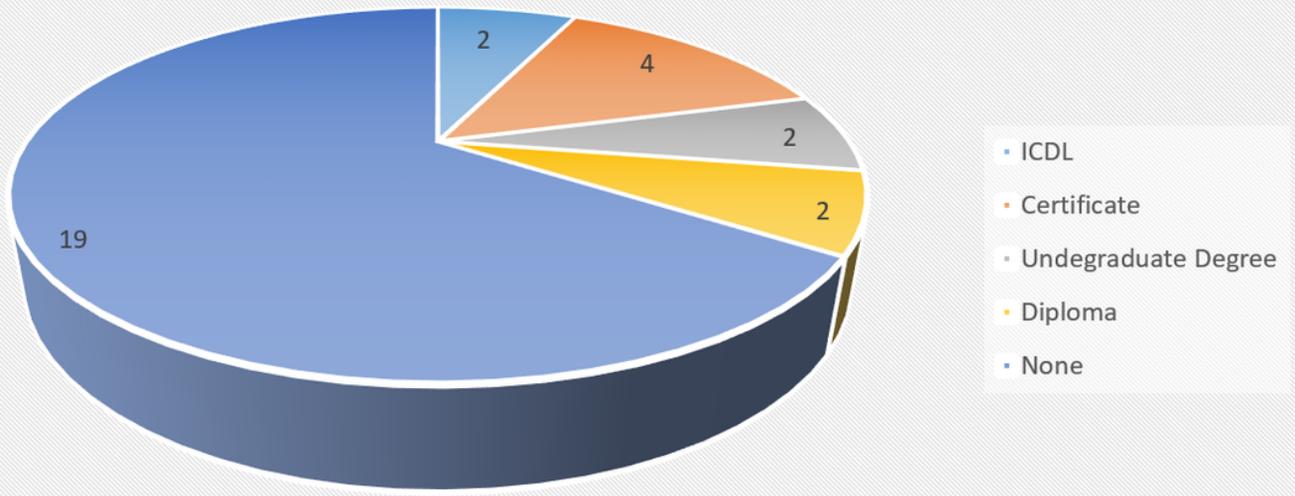


Figure 2

Computer related qualifications of the participants (N=29)