

Disablers and enablers in the uptake of information communication technologies in rural primary schools of Mwinilunga District, Zambia

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Abstract

In this study we interrogated disablers and enablers in the uptake of Information Communication Technologies (ICTs) in five rural primary schools in Mwinilunga district, Zambia. A qualitative research methodology and descriptive research design were applied. An interview schedule and focus group discussions were used as research instruments to interrogate the research problem. Findings of the study were that the teaching of the ICT component particularly in Creative and Technology Studies in rural schools of Mwinilunga district faced many challenges such as lack of ICT equipment, poor internet connectivity, limited skilled human resources and lack of supportive infrastructure. To overcome the disablers, various strategies were applied by schools such as use of personal cell phones as teaching devices, use of zonal schools for capacity building points in ICTs and use of ICT expert teachers as resource persons. The study recommends that Government should make provision for computers and computer facilities in schools through collaboration with other education stakeholders, The government through the Ministry General Education should train more teachers in ICT teaching methodologies and should provide all schools with power supply so that teachers in rural areas can effectively implement the teaching of Information Communication.

1. Introduction

This study is an extract from the lead researcher's master's dissertation pursued at Chalimbana University in Zambia. The thrust of the study focused on implementation of ICT Component of Creative and Technology Studies in Rural Primary Schools of Mwinilunga District, Zambia. The use of information and communication technologies (ICT) has increased in Zambia because of its importance in achieving developmental goals and promoting citizens participation in national development. Acquiring basic knowledge in ICT contributes to national wealth creation. For this to be achieved, education is the best vehicle for carrying out this development.

The research site for this study was Mwinilunga District, one of the remote districts of Zambia, located in North-Western Province. As of the 2000 Zambian Census, the district had a population of 117,505 people (Central Statistics Office, 2010). The source of the Zambezi River is located here, near Kalene Hill, before flowing southwestward into Angola. Mwinilunga is one of the wettest places in Zambia with an annual rainfall of about 1,400mm. Mwinilunga would have benefited from trade with Angola and the DR Congo,

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but wars, bad road conditions and various trade policies between the countries have so far prevented this. Zengamina is a small hydroelectric power generation plant near Kalene Hill in Mwinilunga (Peša, 2013).

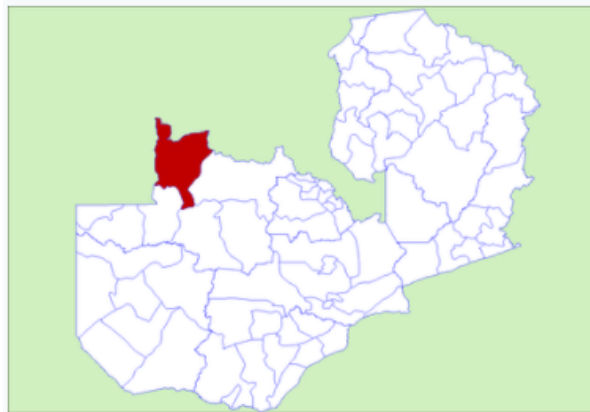


Fig. 1. Location of Mwinilunga District in Zambia

From the time Zambia gained its independence, it has invested heavily in education. The Ministry of General Education has been channelling considerable resources and expertise into creation of effective systems and policies that should have a positive impact on students and learning outcomes (Mengo, 2018). In 2012, a policy framework known as Vision 2030 was implemented with the main aim of developing Zambia. Part of this vision was that education was aimed at moulding learners into whole individuals who will contribute profitably to society (UNICEF & World Bank, 2009). In line with this aim, in January 2014, the PF (Patriotic Front) government implemented the ICT policy in primary and secondary education programmes to provide more opportunities to the disadvantaged school-aged children (Phiri & Phiri, 2017).

1.1 Background

Information communication and technologies refers to technologies that provide access to information through telecommunications. Information technology (IT) is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data (Tech Terms, 2010). Knowledge of ICT is a basic requirement in today's world, and technological progress is driving development in all fields.

The education sector is the only one that can bridge the gap in ICT knowledge. This starts at the grassroots level which is primary education and proceeds to the highest learning institutions. In recent times, we have noted that there is an increasing demand for ICTs in schools. To highlight and expand upon previous foundational studies on the disablers and enablers in the uptake of ICT in rural primary schools, Mphahlele (2018) conducted a study on the use of ICT to support learners experiencing reading difficulties in full-service schools in South Africa. Her study revealed the need to use ICTs in the teaching and learning in primary schools. According to Mwaaba (2015), in Zambia, the teaching of ICT is compulsory and all private, community and government schools are mandated to teach ICT.

In our view, this can be attributed to the heightened levels of civic awareness arising from the civic educational processes. These observations are also echoed in the works of the other scholars among them (Bergersen & Muleya, 2019; Habanyati et al., 2020; Machila et al., 2018; Magasu et al., 2020; Muleya, 2017a, 2017b, 2018a, 2018b, 2019; Mupeta et al., 2020; Mwase, et al. 2020; Mwanangombe et al., 2020).

Therefore, the increased demand for the ICTs in schools is seen as making a huge contribution to the social and economic development in the area of employment and productivity, and in the area of increased access to higher quality of life among the many other factors (Tech Terms, 2010).

Mastering ICT skills and using ICT to improve the teaching and learning environment, according to Boafo (2017), is of utmost great importance to teachers in creating a new learning culture. Ghavifekr and Rosdy

(2015) noted that teachers play a critical role in imparting knowledge to their learners in order to allow them to compete favourably in the modern labour market which is mostly ICT-based. ICT presents many opportunities for improving the way we live, the way we teach and the way we learn.

One of the benefits of using technology in the classroom is that it enriches learning through a combination of audio, video, images, texts and collaboration (Suryazni, 2010). Teaching of ICT in primary schools is very important. According to Mengo (2018), Vision 2030 appeals for a robust general education centred on science and technology through a curriculum that involves new teaching methodologies. The Zambian government has developed an ICT policy that aims at ensuring that children learn ICT from primary to tertiary level.

Though the implementation of the ICT policy is progressing well in some schools in Zambia, some challenges, referred to here as disablers, in line with Simui (2009), Simui (2018), and Simui, Kasonde-Ngandu, Cheyeka, Simwinga, and Ndhlovu (2018) have negatively affected the implementation of the ICT policy as noted by UNICEF and World Bank (2009). This, therefore, poses a problem which requires attention if the goals envisioned in the Vision 2030 are to be realised.

1.2 Statement of the problem

Following the publication of Vision 2030, a government policy was developed in 2012 whose aim is for a strong general education base in science and technology, and provision of a curriculum that takes into account new teaching methodologies. The introduction of ICT in primary schools under the revised curriculum has been observed differently by members of society (Mwambazi, 2019). While the introduction of ICTs is a step in the right direction, its implementation in some schools in Zambia remains limited. This situation if not addressed has the potential of derailing the very good intentions that are espoused in the various policy frameworks guiding education provision in Zambia. The solution to address this matter has become a moral imperative.

1.3 Purpose of the study

The purpose of the study was to explore the implementation of ICT in selected rural primary schools of Mwinilunga district, Zambia.

1.4 Research objectives

The specific objectives that guided this study were to:

- Describe the disablers affecting the teaching of ICT in rural primary schools, and
- Explore the strategies used to enhance ICT uptake in rural primary schools.

1.5 Theoretical framework

The study applied the Technology Acceptance Model (TAM). The model developed by Davis (1989) is an adaptation of the model Theory of Reasoned Action (TRA). The development of the TAM resulted from an IBM Canada contract with the Massachusetts Institute of Technology in the 1980s to evaluate the market potential for new products of the brand and to explain the determinants of computers use (Davis, Bagozzi, & Warshaw, 1989). Davis et al. (1989) defined the two main determinants of TAM as follows: (i) perceived utility – the degree to which a person believes that the use of a particular system may improve his performance; and (ii) the facility of perceived use – the degree to which a person believes that the use of an information system will be free of effort.

2. Literature

To gain an understanding of the existing research and debates relevant to disablers and enablers in the uptake of ICT in rural primary schools, the authors reviewed the recent literature that is presented in this section. Pumulo, Mulauzi, and Walubita (2019) focused on the benefits and challenges of computer

education in the curriculum of Zambian primary and secondary schools. The findings revealed that there was insufficient ICT infrastructure in schools. Teachers had a limited knowledge of computers and lacked interest in ICTs. Equally, there were inadequate ICT facilities and equipment; lack of time to adequately teach computer studies; a large teacher/pupil ratio; unreliable or inadequate power supply; a lack of trained teachers in ICTs; a lack of technical support to maintain and upgrade computing equipment; limited financial resources; and a lack of internet connectivity. The study by Pumulo et al. (2019) was conducted in Western Province Mwanzi, a newly created district, while the current study was conducted in North-Western Province Mwinilunga, one of the oldest and biggest districts in the province.

Phiri and Phiri (2017) focused on negative factors affecting ICT implementation in selected secondary schools in Chipata District. Findings revealed that there were ICT facilities in the secondary schools such as computers, computer laboratories, internet connections, alongside the traditional methods of telecommunication. However, they revealed that projects involving ICT use and integration in the secondary schools had both internal and external challenging factors leading to weak implementation of ICT projects. The study was done in urban secondary schools of Chipata in the Eastern Province, Zambia while the current study was conducted in rural primary schools of Mwinilunga District, Zambia.

Ghavifekr, Kunjappan, Ramasam and Anthony's (2016) findings indicated the key issues and challenges found to be significant in using ICT tools by teachers included limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. The results from an independent t-test showed that use of ICT tools by male teachers ($M = 2.08$, $SD = .997$) in the classroom was higher than by female teachers ($M = 2.04$, $SD = .992$). Their study was conducted in Malaysian secondary schools while the current study was conducted in Zambian primary schools. The former study used a quantitative research design while this study used qualitative research design.

Ndzebele (2013) undertook a study on challenges faced by schools when introducing ICT in developing countries. The findings were that developing countries face several challenges in introducing ICT, mainly a lack of knowledge and skills, time, equipment, maintenance, internet and insufficient funds. The study was conducted in Swaziland using a mixed method design while the current one was conducted in Zambia using a qualitative research design.

Hinostroza (2017) showed that many students and teachers lack the digital skills needed to make effective use of these tools, which limits their potential impact; can have negative consequences for students' learning; and can increase educational inequalities, especially in developing countries.

3. Methodology

This paper is empirical in nature, and a qualitative survey was used to gain in-depth information from the teachers about disablers and enablers in the uptake of ICT in rural primary schools. According to Jansen (2010), a survey can be used to gather information from a sample of entities for the purpose of constructing quantitative descriptors of the attributes of the larger population of which the entities are members. It should, however, be noted that for this study, the authors used an open-ended questionnaire to get responses that were qualitative in nature from the teachers in rural primary schools in Mwinilunga.

3.1. Data Collecting Tools

An open-ended questionnaire was used to collect data from 45 teachers and 5 head teachers from five schools in Mwinilunga district, Zambia between September and November 2019.

3.2. Sampling Procedure

Five primary schools participated in the study: Kanyihampa, Kabanda, Mwinilunga, Nswanakudya and Kasangezhi. The schools were purposefully selected for the study since these are the biggest schools in the district with the largest enrolment of pupils and largest cohort of teachers, representing almost half of the

primary schools in Mwinilunga district. Equally, Nswanakudya and Kasangezhi were schools on the outskirts of the district.

3.3. Data Analysis

The authors read through the responses on each questionnaire completed, mapped out a few general categories and classified the responses. Sub-categories were created from the general ones and they were linked with the objectives of this study, namely, (1) to describe the disablers affecting the teaching of ICT in rural primary schools, and (2) to explore the strategies used to enhance ICT uptake in rural primary schools.

3.4. Trustworthiness

In qualitative research, according to Simon and Goes (2016) or trustworthiness and consistency are discussed in terms of the credibility, transferability, dependability, and confirmability of the instrumentation and results of the study. For this study, the authors conducted member checks, and used reflexivity and peer review.

3.5. Research Procedures

The first author visited the five schools, issued the participants with the information sheet related to the study, and requested the participants to read through and sign the consent form when satisfied with the information. Forty-five teachers returned the consent forms and they were given the questionnaire to complete. The questionnaire was completed in about five minutes and the author brought the questionnaires to other authors for analysis.

4. Findings and Discussions

4.1. Findings

Findings for this study are presented according to the sub-categories formulated in relation to the objectives. The sub-categories are *challenges affecting the teaching of ICT in rural Primary schools* and *strategies applied to enhance ICT teaching in Rural Primary Schools*.

Strategies applied to enhance ICT teaching in Rural Primary Schools.

Given the many challenges faced by primary schools to implement ICTs in teaching creative Technology studies, the following emerged at strategies schools were using as demonstrated in Figure 2 below:

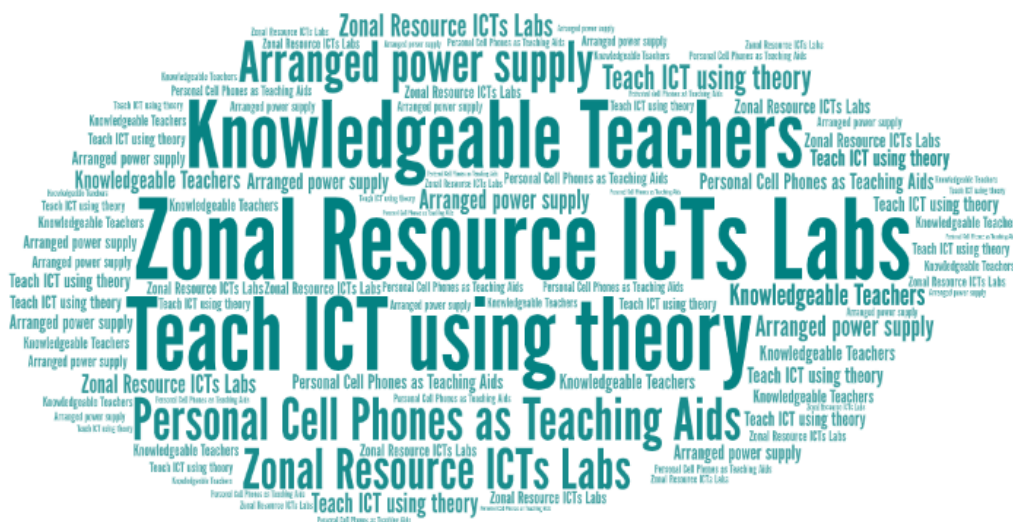


Fig. 2. Antidotes to disablers to uptake of ICTs in Rural Primary Schools

The figure shows that zonal resource centre laboratories were used for all the classes and teachers used their personal phones by to teach ICTs. In addition, schools relied on teachers with expertise in computer studies to orient others during teacher group meetings.

At Kasangezhi Primary School for example, the Head Teacher noted that *“At our school ICT is taught by a few teachers who have acquired some basic skills in computer literacy. Also some teachers who have interest in the subject help others in some topics.”*

The Head Teacher’s observations were echoed by Teacher K who observed that *“We teach the ICT component using theory. We orient ourselves on the teaching of ICT during teacher group meetings.”*

By and large, the lack of specialised ICT equipment and internet connectivity forced teachers to teach theory at the expense of practice. For instance, Teacher M noted that *“Teachers use theory method. Teachers use their phones to teach ICT topics.”*

Equally, teachers were observed to have devised personal initiatives by using their own personal cell phones as gadgets for teaching ICTs. Teacher K at Kanyihampa noted that *“Sometimes teachers use phones to teach ICT. Sometimes teachers with basics orient us during teacher group meetings on how teach some topics. Pupils attend lessons in the computer lab in groups instead of learning at once where by their lesson consumes the time for other.”*

Further, the Head Teacher at Kanyihampa Primary School recounted that *“Our school relies on some few teachers with basics in ICT. These are the ones who handle creative and technology studies. The few teachers who have some knowledge in ICT orient others in teacher group meetings. Sometimes the school arranges for power. When a teacher wants to present an ICT lesson, the school management arranges for power to enable the lesson to be taught.”*

Use of personal cell phones was equally reported at Kasangezhi and Kabanda Primary Schools as Teacher W and head teacher respectively. *“Some teachers use the initiative of teaching the basics with phones. Mostly teachers teach the subject using theory.”* (Teacher W). *“The school relies on a teacher who has recently been deployed who was trained in some basics of computer studies. The same teacher at times orients other teachers on the computer basics during teacher group meetings. Teachers use phones to teach ICT basics to the learners.”* (Head Teacher, Kabanda Primary School).

Other strategies schools deployed included the use of zonal laboratories supported by Zambia Information and Communication Technology Authority (ZICTA). For example, Head Teacher, Mwinilunga Primary School (2020) noted that: *“Twice in a week we take the children to the zonal computer lab to learn ICT due to other classes who need to use the computer lab. We use teachers who have acquired some basics in computer literacy to teach learners. Our teachers sometimes use their phones to teach but [these] are not sufficient.”*

Similarly, Teacher M from Mwinilunga Primary School reported that, *“We use the zonal resource centre lab for all the classes. Sometimes teachers use phones to teach some concepts of ICT.”*

4.2. Discussion

Findings show that 90% of the schools under study are affected by lack of computers. Schools like Kanyihampa and Mwinilunga Primary are zonal centres where there are ZICTA computers. However, they are not adequate since they are the only computers which even the secondary schools situated within the same premise with the primary schools rely on, most often they are used by the secondary schools as indicated by Kanyihampa Primary and Mwinilunga Primary respondents. Kiptalam et al. (2010) observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of 1:150 computer to students against the ratio of 1:15 students in the developed countries.

According to Mungai (2011), computers are still very expensive and, despite spirited efforts by the government agencies, NGOs, corporate organisations and individuals to donate computers to as many schools as possible, there were many schools that were unable to purchase computers for use by their pupils.

The studies indicated that implementation of ICT would require the use of internet as source of information but that this needs to be complemented by traditional libraries. Unfortunately, the internet is only available in the urban schools. There is no internet in most of the rural schools.

Findings indicated that 60% of the schools lacked computer facilities like computer labs. Of the five schools under study, only two schools had computer labs provided by ZICTA. These were Kanyihampa Primary and Mwinilunga Primary. The other three schools, namely, Kabanda, Nswanakudya and Kasangezhi did not have computer labs.

Findings show that all the primary schools did not have funds to purchase school computers due to the free education policy. Primary schools rely heavily on government grants which are not adequate and very erratic.

According to Mandzebele (2013), lack of equipment is another challenge faced by rural schools. The development of ICT infrastructure in a country is dependent on availability of resources such as computers, printers, multimedia projectors, and scanners which are not available in the institutions. The school may have computers and one printer but the other resources are not available. Using up-to-date hardware and software resources is a key feature in the diffusion of technology, but a rare experience in educational institutions.

Insufficient funds challenge the implementation of ICT teaching in rural areas. Effective and efficient use of technology depends on availability of hardware, software and having access to resources by teachers and students and administrative staff. Most of the computers in the schools are donations or projects from private companies or foreign donors. When the responsibility of maintaining the computers rests on the school, this is a challenge.

Findings indicated that 90% of teachers lack ICT knowledge and skills. At the Kayihampa Primary School, out of 36 teachers, four had acquired ICT basics; at Kabanda Primary School, out of 22 teachers, only three had acquired ICT basics; at Mwinilunga Primary School, only two out of 32 teachers had acquired ICT basics; at Nswanakudya Primary School, three teachers out of 10 had acquired ICT basics; and at Kasangezhi Primary School, only two out of five teachers had acquired ICT basics.

Lack of knowledge and skills among teachers is another hindrance to the implementation of ICT in rural schools. Mukalele (2013) confirmed that the demand for ICT learning is high but there are few qualified teachers. Many teachers have not been taught how to teach ICT. Teachers were hired to teach the subjects in their areas of expertise and are expected to teach ICT as well (Mandzebele, 2013). According to Kassimu (2015), other contributing factors include teacher's unwillingness and lack of interest to teach ICT. According to Mungai (2019), there are more students willing to be taught computing skills than there are teachers to transfer the skills. This points to what others refer to as the "digital immigrant syndrome" (Muleya, Simui, Mundende, Kakana, Mwewa & Namangala, 2019, p. 6). This calls for investment in capacity building of teachers in the pedagogy of ICTs tools as well as usage of social media for teaching and learning purposes (Simui et al., 2018; Simui, et al., 2017).

Findings were that 40% of the schools under study did not have electricity or any other form of power supply. Kasangezhi and Nswanakudya did not have a power supply and experienced erratic access to the internet to facilitate the teaching of ICT despite having some teachers with ICT basics. Zambia National Union of Teachers (ZNUT) general secretary agreed that ICT lessons would not be a success unless electricity and computers were made available in all rural schools (Mengo, 2018).

According to Mungai (2011), whose study was undertaken in Kenya, lack of electricity hinders the teaching of ICT in rural schools. Many schools are still not yet connected to electricity; Kenya is a developing country, and the government has not been able to connect all parts of the country to the national electricity grid. Consequently, those schools that fall into such areas are left handicapped and may not be able to offer computer studies.

Many studies have indicated the challenge in implementing ICT in the developing countries especially in rural schools of Zambia. Mungai (2011) agrees that African countries are lagging behind in the implementation of ICT; that the digital divide continues to widen; and the digital literacy challenges are increasing.

5. Conclusion and Suggestions

Basing on the research findings, the conclusion is that the implementation of ICT in rural schools faces a number of challenges. The study indicates that schools in rural areas are faced with the challenge of lack of infrastructure and computer facilities. The study shows that schools in rural areas are faced with the challenge of lack of funds to purchase school computers. The study also found that many teachers lack ICT knowledge and skills, and there are still some schools which are not connected to any kind of power supply this hinders effective teaching ICT.

Drawing from the findings of the study on challenges in implementation of ICT in rural schools, the following suggestions are made:

- Government should ensure that all the schools are provided with computers and other facilities through collaboration with other education stakeholders and donors.
- Government through the Ministry of General Education should ensure that teachers acquire ICT knowledge and skills to effectively implement ICT policy in rural schools.
- Government should supply schools in rural areas with power.

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