Experiences of Learners with Visual Impairment in the Use of Information Communication Technology in Two Selected Schools in Kabwe District

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ABSTRACT

This study was on the experiences of learners with visual impairments in the use of information communication technology in two selected secondary schools in Kabwe district, Zambia. Research objective aimed at establishing how learners with visual impairement describe their use of Information Communication Technology (ICT) in selected secondary schools of Kabwe district. The question was, how do learners with visual impairment describe their use of ICT in selected schools of Kabwe district? It had a sample of twenty -two (22) participants. It used the following instruments; Unstructured interview guide was employed to collect data from parents and class teachers. The focus group discussion guide was used to collect data from learners. Additionally, the observation checklist was used to for observing learners while learning ICT.

This research was qualitative in nature. The Social Model of Disability as enunciated by Oliver (1984) was employed. The study used constructivism paradigm and a phenomenological research design. The key findings were that, learners with visual impairment described their use of ICT in schools as being positive transformative and empowering experience as well as challenging. Learners with visual impairment faced unique challenges in accessing and effectively using ICT tools such as such as lack of enough ICT devices, lack of trained ICT staff, learners were not given enough time to learn ICT skills due to limited time allocation for ICT on the main time table and having no room allocated for ICT, there was a problem of internet connectivity, insufficient software updates, limited availability of tactile graphics, complex website and accessible applications, some parents were lacking funds for purchasing gargets for their children lessons such as Ipads, smart phones, tape recorders, laptops suitable for visually impaired learners and some teachers were not allowing learners to record their lessons. The study found that there was a positive impact of ICT learning on learners with visual impairment because learners had access to ICT devices such as computer, smart mobile phones, braille display. they were able to access information and learning materials, do research and were able to learn such as writing than before. Other learners partially acquired the ICT skills especially those who were supported by the families.

Basing on these findings the study made suggestions that included a need to train teachers handling learners with visual impairment in the area of ICT; a need to allocate extra time for ICT lessons in order for learners to improve on accessibility of academic information and usability of ICT skills which leads to positive academic performance; a need of having enough ICT devices as opposed to having one computer against many learners; a need for financial support to parents from social cash transfer and increased financial support to schools for easy procurement of ICT devices; a need for government to take full responsibility of providing ICT tools for learners with visual impairment for them to fully participate in educational systems; a need to have a policy and eventually a law in support of ICT accessibility and usability in educational settings; a great need for school administrators to collaborate with other stakeholders who can assist learners with specific ICT materials and devices; a need for the school to hold fundraising ventures and use the money realized for procuring of ICT devices and assistive technology materials; furthermore there is need to

have ICT classroom in the school. The study recommended the implementation of all the suggestions in order to create conducive learning environment for learners with visual impairment in terms of ICT learning.

Keywords: Visual Impairment, phenomenological design, Information Communication Technology (ICT), Learners

INTRODUCTION

Many learners with visual impairment do not have the experiences in the use of information communication technology such as access to assistive devices such as braille writers, screen readers, or other adaptive technologies that could make their learning more efficient (World Health Organization, 2021). Globally, people who are visually impaired may find themselves at a social disadvantage due to their visual limitations. This prevents them from carrying out their expected contextual roles according to their age, sex, social and cultural factors. As supported by Ahmed and Naveed (2020), the limitation of activity and restriction of participation can extend to all areas of life for those with visual impairment, including learning, communication, mobility and interpersonal relationships. Consequently, for learners with visual impairment in schools it is often a daily occurrence. However, there are potential ways to overcome some of the problems resulting from visual limitations. One such way is use of ICT as a pedagogical tool to support visually learners with visual impairment.

Learners with visual impairment have an equal opportunity to learn just like everyone else. As described by Vaishali and Vijayalakshmi (2020) in India, a person is said to be visually impaired if the presenting visual acuity (VA) in the better eye is worse than 3/60. The learners with visual impairment are those having a visual disability that is so serious as to impair significantly their capacity to see things either completely or partially. Thus, interfering with their capacity to perceive visually presented materials. However, Barnes-Holmes and Moors (2013) refer to learning as a function that maps experience onto behavior and it is seen as 'an effect of experience on behaviour' viewing learning as a product, a thing, has the virtue of highlighting a crucial aspect of learning and change. Education can be defined as a purposeful activity directed at achieving certain aims, such as transmitting knowledge or fostering skills and character traits by people involved in education processes (Yekini and Lawal, 2012). Hence, Information Communication Technology (ICT) refer to all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking and other media applications and or services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form.

Across the globe today, the educational systems are adopting new technologies to integrate ICT in the teaching and learning processes in order for them to prepare learners with the knowledge and skills they need in their subject matter. In this way the teaching profession is evolving from teacher-centered to student-centered in most learning environments. The learners with visual impairment having the opportunity of being in an inclusive classroom have no option but to also learn using ICT (Odame and Moragn, 2019). However, the experiences of learners with visual impairment in the use of information communication technology remain unexplored.

Interestingly, as the introduction of ICT in all twenty first century schools are looming, then there can be no doubt that every learner needs to at least know computer basics as enshrined in the curriculums worldwide (Yates, et al, 2012; Wang, Han et al, 2015; Walker, et al, 2001; Thompson, 1998, Soto, 2005). According to the study conducted in the United States found that, individuals with visual impairment were not fully benefiting from the use of computer assistive technology at home, school and community (Gamble and Hirsch, 2003). Though the use of ICT for both teachers and learners without visual impairment has resulted in good experiences that even other people are beginning to familiarize themselves with technology on a daily basis. Though there was no or little study if any in Zambia that explored the experiences of learners with visual impairment in the use of information communication technology

In most African countries, learners with visual impairment who do not use ICT face a number of challenges (Rahman and Cave, 2001). In support of this assertion, Smith (2008) with the findings obtained from Ghana

indicates that it appears no invention has enabled blind and visually impaired people to communicate effectively using assistive technologies that have made computers and the internet accessible. For instance, assistive technology involves both assistive technology devices and assistive technology services and-that schools are mandated to have (Presley and D'Andrea, 2008). Even though an assistive technology device whether acquired commercially off the shelf, modified, or customized could be of use to increase, maintain, or improve the potential capabilities of children with visual impairment, the experiences of learners with visual impairment in the use of information communication technology was silent in Zambia which this study aimed to explore.

The use of computer assistive technology has captured the attention of learners with visual impairment. Specifically, computer assistive technology has given learners with visual impairment ever-expanding opportunities for personal and professional growth (Sah, 2013). Apparently, success in getting information in our society today, demands computer literacy. Failure to have assistive technology or without the skills in the use of computer assistive technology, these learners may find it difficult to access the computer and explore maximally within the world they live in. The gap is that the experiences of learners with visual impairment in the use of information communication technology in Zambia was not exploded.

There has been an introduction of ICT in schools in Zambia under the new revised school curriculum of 2013 which has led to different outlooks in educational institutions. To this effect, some people have received the development positively while others have given a different view on the newly-introduced subject of ICT as replected in the Ministry of General Education- Implementation of ICT in the curriculum and its impact, (MOE, 2019). The learners with visual impairment have not been left out on the issue of using ICT even in schools. It is understandable that communication information technology opens access to knowledge not only for the benefit of individuals but the country as a whole. It is difficult to refute that ICT in the 21st century has become a basic skill required in all areas of individual, national and global development. However, the experiences of learners with visual impairment in the use of information communication technology was not documented.

ICT is largely viewed as a major tool for building knowledge in societies the implementation of Computer Studies in Zambian schools has been done. Despite the progress that has been made, many secondary school the experiences of learners with visual impairment in the use of information communication technology remained silent.

Several studies have highlighted benefits and challenges of using ICT among learners with visual impairment in improving the quality of education (Gerber and Kirchner, 2007). The experiences of learners with visual impairment in the use of information communication technology was not explode which this study exploded.

Learners with visual impairment tend to learn academically and about their environment mostly through the sense of touch and hearing and ICT is of great help while learning at school. Though the ICT is being implemented worldwide and in Zambia the experiences of learners with visual impairment in the use of information communication technology in Zambia remained unexploded. Hence, this study on experiences of learners with visual impairment in the use of ICT in selected secondary schools in Kabwe district of Central Province.

Statement of the Problem

It was difficult to ascertain the kind of experiences that learners with visual impairment have had in their use of ICT in Zambian schools. It was not known if there was any study focusing on the experiences of learners with visual impairment in their use of ICT since its introduction in Zambian schools (Mutale and Mweetwa, 2021). Therefore, the study intended to fill this gap by undertaking to establish the experiences of learners with visual impairment in the use of ICT in selected secondary schools in Kabwe district of the Central Province of Zambia.

Purpose of the Study

To establish the experiences of learners with visual impairment in the use of ICT in two selected secondary schools in Kabwe district, Zambia.

Objectives of the Study

1. To establish how learners with visual impairment describe the use of ICT by learners in selected schools of Kabwe district of Central Province.

Research Questions

1. How do learners with visual impairment describe their use of ICT in selected schools of Kabwe district of Central Province?

LITERATURE REVIEW

This is a critical review of existing literature which analyses the strengths and weaknesses of prior research and identify clear gaps of different literatures that this study addressed by building upon and extends previous work it is based on the objective of the study.

How learners with visual impairment describe their use of ICT

Each and every child in school whether with or without disability, they deserve an equal opportunity to be as literate as they can aim to become and-that there is no need to limit the academic progression of any learner out there. Some measures as indicated by Ahmed and Naveed (2020), the schools should endeavor to provide good rooms where the learners can access internet, have a smooth access to auditory devices and braille prints.

According to Amponsah and Bekele, (2022) the findings indicate that the general policy frameworks are available in the some institutions but they were limited in salience and significance as they did not consider the inclusion of learners with visual impairment in online learning and helping them in their daily experience with ICT. Some forms of digital technology were also available in the studied institutions but their accessibility and usability remain a challenge to the learners with visual impairment. The discoveries of the authors were intended to be discovered by the current study of having a policy for ICT which includes these learners with visual impairment describe their use of ICT in their institutions.

According to Ryan, et al, (2016) findings were that, educational institutions should strategically build the capacities of their staff concerning the ICT programs to better serve learners with visual impairment using online learning settings. This was a positive discovery which was intended to be discovered by the current study of finding out if the teachers who were teaching learners with visual impairment using ICT were trained in ICT.

Swan, (2002) argues that the use of ICT can positively transmit knowledge to learners with visual impairment. Furthermore, the availability and use of ICT materials can help learners exploit enormous possibilities for acquiring information for schooling purposes and can increase learning through communication. The current researchers were in support of this findings and aimed at discovering if ICT materials were available when learners were learning using ICT at the study site.

According to Shin, (2002) the study concluded that, where ICT was clearly embedded in classroom activity, there was a positive impact on pupil attainment at GCSE level. This was a positive discovery from Shin (2002) and of which the current study wanted to discover the impact of using and not using ICT while teaching learners with visual impairment.

Research Gap

Many scholars have researched on the issue of ICT in educational settings as it has been reviewed in the literature above. Despite the area of ICT being researched by scholars, there is still a gap on the need to indicate the reality of how learners with visual impairment use ICT while learning. For instance, this is one of the reasons why schools should provide all their learners with an appropriate and equitable level of experience of ICT at all class levels. By so doing, the experiences of learners with visual impairment in using ICT shall be managed smoothly. Hence, the themes concerning assistive technology, accessibility and universal design and identifying barriers and facilitators of ICT were also being taken into account as the study intended to carry out this study.

METHODOLOGY

Research Paradigm

The study was qualitative and used the interpretivism paradigm associated with the aforementioned research objective. This is a model that states that participants (learners, teachers, head teachers, and parents in this study) interpret their world through lived experiences rather than just passively taking information (Donalek, 2004). Learners communicate with each other and share their understandings, feelings, knowledge and experience to come up with new knowledge. In research, it is basically a model based on lived experienced study. For instance, as people experience the world and reflect upon those experiences, they build their own representations and incorporate new data into their pre-existing knowledge. This can be used in qualitative (method; open-ended questions, emerging approaches, text and/or image data). In this study the paradigm was used by the study through taking into account on the responses which were provided by the participants in order to interpret, analyze and write the research report.

Research Design

This study used a phenomenological design and the choice of phenomenological design helped the study to establish experiences of the targeted learners with visual impairment with regard to their use of ICT through the descriptions that they provided. The goal for using this particular design was to help in describing the meaning that experiences held for each respondent. It was hoped that this type of research design would enable the study to reach out to the participants and asked them to describe their experiences as they perceived them. Furthermore, this research design was considered to be flexible and interactive in nature and as such, it enabled for the creation of good rapport between the study and participants and provided a free and relaxing environment in which they expressed their views freely (Donalek, 2004). The study made use of the lived experiences of participants in terms of using ICT as they learn.

Target Population

The study targeted learners with visual impairment in inclusive school settings in Kabwe district who used ICT. It also included the teachers and some parents of learners with visual impairment. This was done in order for the study to collect credible data from the participants.

Sample Size

A total of twenty-two (22) participants constituted the sample of this particular study drawn from the two sites. It was broken down as follows: five (5) learners with visual impairment from each purposively selected secondary schools practicing inclusive education in Kabwe, three (3) Class teachers and three (3) parents from each school.

Furthermore, determining the adequacy of a sample size, including why 22 participants might be sufficient for this study, depended on several factors related to the research design, goals, and the nature of the analysis. This study used 22 sample size participants because of saturation point and in qualitative research, a concept known as data saturation is important, this occurs when new data no longer provide substantially

new insights or information (Creswel, 2012). Other than that there was no hard and fast rules. The limitation of this sample size is that, the findings of this study can only be applied to similar situation and may not be generalized.

Sampling Strategy

The study used homogenous purposive sampling technique in coming up with class teachers, parents and learners with visual impairment from schools who were involved in the study. Purposive sampling is the method used that purposely targets a group of people believed to be reliable for the study (Kombo and Tromp, 2006). For example, the purposive sampling is often used when a study wants to gather in-depth insights from a particular subgroup or population that is relevant to his or her study (Smith and Brown, 2018). The technique was applied as follows: the researcher visited the head teacher's office to air out the type of participants that were needed for the research and then the head teacher out of discretion guided the study in terms of selecrion of the sample. In addition, the study required participants with specialized knowledge, expertise, or experience, purposive sampling helped identify and included individuals who possessed these qualities.

Methods of Data Analysis

Deductive thematic analysis was used for analysis. This is a qualitative data analysis method that involves reading through a data set such as transcripts from in depth interviews or focus groups and identifying patterns in meaning across the data to derive themes. It involves an active process of reflexivity, where a study's subjective experience plays a central role in meaning, making from data and it helped the study to make interpretations and descriptions of the data which was collected from the field. Data which was collected through focus group discussions, observation checklists and interviews were coded and put into themes.

A Cyclical six-phase thematic analysis framework was employed which is characterized by familiarity with data, creation of own initial codes, collation of codes with supporting data thereafter, grouped codes into themes and then reviewed and revised themes and wrote up once narratives to tell the story of the data and meanings (Braun and Clarke, 2006). The Microsoft Excel was equally used as an instrument of thematic analysis. Thus, it was used to code and thematically analyze qualitative data as opposed to doing the analysis manually and this was done because the study hails it in high esteem to be appropriate. The actual words said by participants were used as much as possible in the descriptions. The participant teachers were coded with numbers as T1, T2, T3 and T4, T5 and T6, parent participants were coded letters P1, P2 and P3, P4, P5 and P6 and school head teachers were coded Y and Z. For learners with visual impairment, they were coded as L1, L2, L3, L4, L5, L6, L7, L8, L9 and L10. Hence, the findings of this study were presented under the main research questions.

Presentation of Findings

This section presents the study findings as per research objective which established how learners with visual impairment, teachers, parents to learners with visual impairment and head teachers describe the use of ICT at school. Findings from the teachers were presented alongside those from parents to learners with visual impairment, learners and school head teachers.

How Learners with Visual Impairment, Head teachers, Teachers and Parents Described The Use of ICT

Describing the use of ICT in schools

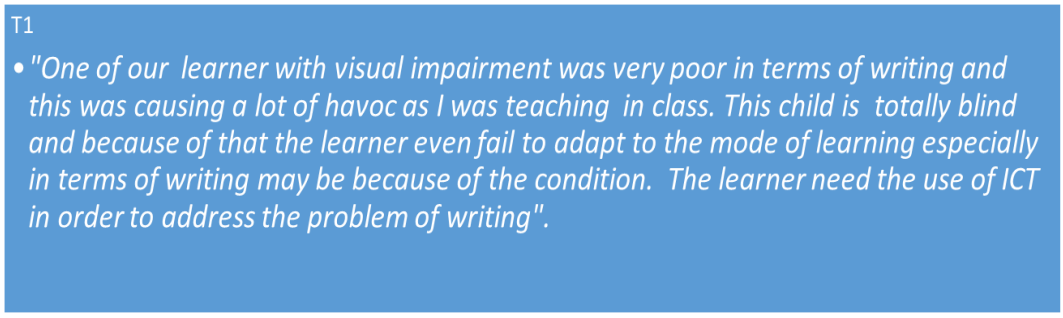
From the interview which involved the head teachers, it was mentioned that learners with visual impairment and their use of ICT had some distinctions and-that challenges and progress were recorded. One of the Head Teachers Z lamented on the need to have a more advanced session on the aspects of describing learners with

visual impairment' use of ICT in schools. The participants' Z and Y were on point to state as indicated in Table 1;

Table 1: Response from the head teachers describing the use of ICT suitable for them

Respondent	**Response**
Head teacher Z	"*ICT had some distinctions and-that challenges and progress on record. Therefore there is a great need to have a more advanced session on the aspects of describing learners with visual impairment' use of ICT in schools and that learner with visual impairment need to be equipped with more specific ICT equipment and materials such as JAWS, computers, laptops to mention a few".*
Head teacher Y	*"ICT has proved to be of help to learners with visual impairment and there is need for supporting them by providing them with specific ICT devices".*

Figure 1: Describing the use of ICT BY T1



Tale 2: Describing the use of ICT in schools; Responses from the Teacher

Respondents	**Response**
T2	*"I think, I would put it this way, the learners at this school tend to describe their use of ICT in a way that helps them in their daily activities on teaching and learning as a whole. For example, some learners with visual impairment describe their use of ICT as less challenging and for others they describe as more challenging because of their problems with sight.* *Not only that, we have also provided them with a desktop computer which was provided by a well-wisher and we use that same computer in terms of all related subjects and to orient them on how to use it. At least with the installation of Job Access With Speech (JAWS), it has brought some light on the senses of children when learning. This is because JAWS is able to speak or talk on what to press, where to press, how to press and it directs on other moves. The only problem is that there is only one JAWS against so many learners".*

Response from the learner with visual impairment describing the use of ICT

L10 described the use ICT as follows:

" As much as we appreciate the use of ICT in our school work, support in terms ICT learning it has not been easy due to lack of trained staff, support from our parents, buildings such as ICT rooms and enough appropriate devises for us and it really affect our academic performance at school."

Access to ICT Devices

Most learners with visual impairment reported having access to ICT devices such as computers, tablets, or smartphones at school and home. Schools provided some few specialized ICT tailored a big number of visually impaired learners. Table 3; below summarizes ICT access among participants:

Table 3: Learners acknowledged having access to ICT devices

Device Type	Total No. of Learners (N=10)
Computers	8 out of ten
Tablets	3 out of ten
Tape recorders	3 out of ten
Smartphones	5 out of ten
Braille Displays	4 out of ten

Findings from Table 3 show that, the majority 8 (80%) of the participants mentioned that they had access to computers. This may imply that most learners had access to the Computer device and the minority, 3(30%) had access to Tablets and Tape recorders, which may imply that the learners who were provided with devices by their parents were few.

Majority of the participants mentioned that their schools provided specialized assistive technology for visually impaired learners. One learner with visual impairment coded as L3 narrated information as indicated in Table 4; Another visually impaired learner from FGD 1 added in a similar manner on how the learner described their use of ICT in schools. Even others contributed in a more similar aspect on the need to get more familiar with technological devices despite learners having visual impairment as a disability. Some more contributions of similar information were made by learner L1 with visual impairment as indicated in Table 4:

Table 4: Access to ICT; Responses from Learners with Visual Impairment

Respondent	Response
L3	*"Before my mother bought me a laptop, it was extremely difficult for me to learn. I had no access to a usable laptop or even a Braille slate. Now, my experience with ICT has significantly improved."*
L1	*"I can now type letters on the computer, form words, and practice writing in class. ICT use is still a challenge, but there has been progress."*

Access to ICT; Responses from the parent

P6 described the use of ICT as follows: *" I appreciate the use of ICT in the school because I am able to see my child accessing academic information from ICT devices such as smartphone which my child asked me to buy so that it could be used for school work while learning".*

Challenges while Using ICT

Challenges Faced by Learners

Despite improvements in ICT access, learners with visual impairment still faced several challenges:

Table 5: Challenges faced by learners

Challenge	No. of Learners Reporting (N=10)
Lack of personal ICT devices	4
Inadequate time for training using ICT devices	6
Limited availability of enough JAWS (screen reader)	10
Internet connectivity issues	5

Findings from Table 5 show that 10 (100 %) of learner participants faced challenges of inadequate screen readers, and the minority 4 (40%) did not have ICT devices. These findings may imply that it may be difficult for learners to meet their ICT related objectives in their education.

A teacher reported having observed learners with visual impairment strangling while writing as reported below;

A teacher T1 noted the struggles of a partially sighted learner: *"One of my learners had difficulty adapting to writing. After engaging the guardian, they purchased a laptop for the child, and since then, there has been significant progress."*

A parent P3 noted the struggles of his own child due lack of ICT devices. Some other parents had similar sentiments like that of parent P3. Another parent echoed in a similar manner by stating that, *"My child who is blind have difficulty adapting to writing using ICT as required by the school and l lack funds to purchase any of those devices needed and it has affected my child in terms of the academic outcome at school by not passing and I am worried."*

Head teacher Z reported on challenges faced by learners while learning using ICT by stating that,

"Learners with visual impairment faced unique challenges in accessing and effectively using ICT tools such as lack of enough computers in school against the number of learners, lack of trained ICT teachers, and there is no class rooms allocated for ICT due to lack of enough buildings. Some parents were unable to procure ICT tools for their children to use during the lessons such as Ipads, smart phones, tape recorders, laptops suitable for visually impaired learners. The learners were not allowed to record using their tape recorders or phones by some teachers. There is lack of support from some stakeholders in terms of ICT instruments. Some parents lacked finances for procuring ICT tools or equipment. Learners are not given enough or extra time to learn ICT skills they only use the normal learning hours because of the school being inclusive".

During (FGD 1) for learners with visual impairment and (FGD 2) for teachers, several challenges affecting the learners in the use of ICT in schools were coded from the discussions and are indicated in Table 6:

Table 6: Challenges in Using ICT responses from both learners with visual impairment of (FGD 1) and of teachers (FGD 2)

Challenges	**Description**
Complex Websites and Non-Accessible Applications	Many websites and applications lack accessibility features, making navigation difficult for learners with visual impairment.
Limited Availability of Tactile Graphics	The absence of tactile diagrams in digital content hinders the understanding of certain subjects, especially science and mathematics.
Infrequent Software Updates and Compatibility Issues	Assistive technologies sometimes lack updates or are incompatible with school-provided devices, limiting their usability.
Lack of enough Computers and ICT Devices	Insufficient computers and assistive devices in schools prevent many learners from fully utilizing ICT for learning

Time Allocation for ICT Use

Despite having scheduled computer lessons, most learners with visual impairment expressed concerns about the limited time allocated for ICT practice. For instance, participant L3 noted that: *"At this school, we are not given enough time for us to practice computer use, and this has affected our daily typing skills and styles. As a result, we fail to finish typing tests within the stipulated time, which negatively impacts our performance. It is a sad reality."*

Additionally, L5 also reported dissatisfaction with the frequency of ICT lessons, which were held only once a week, and expressed difficulties in adapting to the keyboard layouts of desktops and laptops.

Assistive Technology for Learning

It was reported that, Assistive technology played a crucial role in enabling ICT learning among learners with visual impairment The following technologies were identified as essential in the study by T3:

Assistive Technology	**Purpose**
JAWS (Job Access With Speech)	Screen reader for navigation and text-to-speech conversion
Braille Displays	Provides tactile feedback for text-based content
Voice Command Software	Assists in hands-free navigation
Specialized Keyboards	Designed for visually impaired users

The head teacher Z stated that, *"With the donation of one computer which has JAWS being installed in it from one well-wisher has been a great relief to the learning of ICT among learners with visual impairment. Though we need more of such support because the learners are many against one computer."*

Teacher T2 equally described how assistive technology has impacted learning: *"With the support of a well-wisher, we obtained a desktop computer with JAWS installed. This has empowered learners with visual impairment to learn ICT more effectively though we need more of such computers because learners are many against one of such computers".*

Teacher T1 emphasized the role of assistive technologies: *"With the installation of JAWS, learners with visual impairment can now navigate ICT tools more independently. The software reads aloud what they press on it and it has been improving their digital literacy."*

Impact of ICT on Learning

The role of ICT in enhancing learning was highlighted by many participants who expressed a positive outlook on ICT, emphasizing its significant impact on the learning experiences of learners with visual impairment. For example, T1 disclosed that, *"Accessible digital textbooks and screen readers, particularly JAWS, enabled independent reading and research for learners who had access to school computers or personal devices".*

For instance, in FGD 2, teacher T3. Narrated that, *"Online resources and educational platforms provided a vast repository of accessible academic learning materials".*

One of the parents equally pointed out that, *"Since the introduction of ICT my child is able to learn well and interact with friends even after school on academic issues than it was before".*

L4 expressed a positive outlook towards ICT by emphasizing that *"It has significantly improved our learning experiences. The accessible digital textbooks and screen readers are particularly appreciated for enabling independent reading and research for us learners who were able to use JAWS installed in the school computer and for those who had personal computer devices, optical character recognition (OCR) scanners. and those who were using Talk Back which is found on smart mobile phone".*

Head teacher Y acknowledged the value of ICT communication and collaboration tools having a positive contribution to the learning of learners with visual impairment. These included email, instant direct messaging, and virtual classrooms. The head teacher Y further reported that, *"Video conferencing for teachers and voice chats for learners with visual impairment facilitated interaction with peers and teachers, bridging the gap caused by physical barriers for example during the corona virus disease 2019 (COVD-19) pandemic period*".

Parent P3 narrated that, *"Communication was distorted when 2019 (COVD-19) pandemic came we thought our children would stop learning but both collaboration and communication was restored with the utilization of online learning for learners with visual impairment in schools when teachers were teaching them".*

Suggestions for improving ICT accessibility and usability in educational settings

The findings highlighted the suggestions for improving ICT accessibility and usability in educational settings.

Head teacher Z stated that, *"While a considerable percentage of learners with visual impairment reported having access to assistive technology, there are still challenges to overcome by improving issues of accessibility, integration of ICT into classroom activities, and adequacy of the available ICT devices".*

Head teacher Y suggested that, *"There is need to provide proper training to teachers in the area of ICT and support learners with visual impairment through the provision of enough ICT devices and give them ample time in terms of utilizing these tools effectively"*.

Parent P4 suggested that, *"Most of us face financial challenge such that we even fail to procure ICT equipment for our children who are blind and partially sighted , we ask for financial considerations from social cash transfer in order to address this significant barrier".*

T3 emphasizing the need for increased support to ensure equitable access to specialized assistive technology requirements such as equipment for all learners with visual impairment.

T1 suggested that the government need to provide a policy and consequently a law. It should as well provide ICT devises such desktop computers which are installed with jaws, smart mobile phones, laptop and audio tape recorder as a way of creating a conducive and supportive educational learning environment for learners with visual impairments while acquiring ICT skills".

T2 suggestion emphasized the significance of collaborative efforts between stakeholders especially those who are technology developers, policymakers, and businessmen in order to address the specific needs of learners with visual impairment.

P6 stated that, "*There is need for the school to organise fundraising venture in order to raise funds for procuring more ICT tools"*.

Another suggestion from T1 was that, "*The school should create extra time of learning ICT skills in order for learners to grasp the ICT skills".*

Head teacher Y suggested that, *"The parents should take responsibility of buying the ICT equipment for their children".*

L2 suggested that, "*There is need for us to be taught by trained teachers in ICT".*

DISCUSSION OF FINDINGS

How Learners with Visual Impairment Describe their use of ICT

During the focus group discussion and interviews with learners who have visual impairment, head teachers and parents, the discussion and interviews yielded valuable insights into their experiences and perspectives regarding the use of ICT at school. The discussion is based on the themes that were generated from this study and these are; Describing the use of ICT in school, access to ICT devices, challenges while Using ICT, time allocation for ICT use, Assistive Technology for learning, impact of ICT on learning and suggestions for improving ICT accessibility and usability in educational settings.

Describing the use of ICT in school

The study discovered that there was need for specific ICT devices and those which were available were not enough. ICT helped learners with visual impairment to learn. Some learners faced challenges while learning

using ICT others did not. Job access with speed (JAWS) was found to be very helpful to these learners. There were no trained staff in ICT. There was lack of support from some parents. There was no room specifically allocated for ICT. These descriptions were both positive and negative.

These current findings are partially similar to the findings of Mwango (2017) who attributed that the use of ICT in institutions of learning has potential to give learners a head-start to their future when learning how to use the internet to do effective research. For this reason, being conversant with ICTs in the 21st century is seen as a basic skill needed not just for personal development, but also for the benefit of the nation and global economy. These findings were partially similar to the current study because Mwango (2017) did not pay attention to the other specific findings as pointed out in this current study other than learning with the use of internet.

The findings on lack of trained human capital to handle ICT issues is consistent with Mundende's (2015) works in relation to Geography Field work, where quite a good number of teachers were not qualified to prepare learners to finally write the Geography Field Project at the end of their Grade 12.

Access to ICT devices

The study found that learners with visual impairment had access to ICT devices such as computers, tablets. smart mobile phones and braille display.

The current study showed that learners with visual impairment were able to access ICT devices while the findings of Dobransky and Hargittai (2006) mention technical accessibility problems as one of the extra barriers that people with a visual disability needed to tackle. The findings were not similar because, learners in the current study learners had access to ICT devices and helped them to learn while the study by Dobransky and Hargittai (2006) revealed that ICT was a barrier to learning by learners with visual impairment.

Challenges while Using ICT

The study revealed that the learners faced challenges while learning using ICT. For instance, there was lack of enough ICT devices, lack of trained ICT staff, lack of enough time for training due to limited time allocation for ICT on main time table and having no room allocated for ICT. Other challenges were that, there was a problem of internet connectivity, insufficient software updates, limited availability of tactile graphics, complex website and accessible applications. Furthermore, other challenges experienced were that, some parents were lacking funds for purchasing gargets for their children and some teachers were not allowing learners to record their lessons.

The findings of the current study were partially similar to Mack et al. (1990) who carried out a study on computer training of learners with visual impairment and found that teachers of learners with visual impairment had poor or non-existent knowledge of specific areas of technology. The study by Mack et al. (1990) was partially similar to this study because they found that teachers of learners with visual impairment were not trained in the areas of technology as revealed by this current study however, this study has revealed more challenges the learners with visual impairment experienced while using ICT as compared to Mack et al. (1990).

Furthermore one finding of this study was that, there was lack of enough ICT devices. This finding is similar to the findings of Muzata and Penda (2014) who conducted a study on pedagogical experiences of students on school teaching practice in two teacher training institutions on the Copper belt and Central Provinces of Zambia and found that generally the use of teaching and learning aids was limited.

Assistive Technology for learning

The study unveiled the following assistive technologies which were found at schools such as tape recorder, JAWS, braille display, voice command software, specialized keyboard, a computer installed with JAWS donated by a well-wisher and all helped learners with visual impairment to be independent.

These findings are partially similar to the findings of Gerber and Kirchner, (2007) in Ghana who found that assistive technology which makes this navigation possible for persons with visual impairment is the Job Access with Speech and magnification software programs. In their study, they only found one assistive technology which was also unveiled by the current study. Nevertheless, the current study found more assistive technologies as listed under assistive technology for learning other than the JAWS.

Impact of ICT on learning

The study found that learners with visual impairment were able to access information, do research, access learning materials and were able to learn such as writing than before as being the of impact of ICT on their learning.

According to Shin, (2002) the study concluded that, where ICT was clearly embedded in classroom activity, there was a positive impact on pupil attainment at GCSE level. This was a positive discovery from Shin, (2002). This was similar to the current study which discovered the positive impact of using ICT while teaching learners with visual impairment.

Furthermore, Swan, (2002) argues that the use of ICT can positively transmit knowledge to learners with visual impairment. Furthermore, the availability and use of ICT materials can help learners exploit enormous possibilities for acquiring information for schooling purposes and can increase learning through communication. The current researchers were in support of this findings and discovered that availability of ICT materials helped learners to learn.

Suggestions for improving ICT accessibility and usability in educational settings,

The study suggested that, there is to train teachers handling learners with visual impairment in the area of ICT. There is need to allocate extra time for ICT lessons and training in order for learners to improve on accessibility of academic information and usability of ICT skills which leads to positive academic performance. There is need of having enough ICT devices as opposed to having one computer against many learners. There is need for financial support to parents from social cash transfer and increased financial support to schools for easy procurement ICT devices. There is need to have a policy and eventually a law in support of ICT accessibility and usability in educational settings by the government. There is a great need for school administrators to collaborate with other stakeholders who can assist learners with specific ICT materials and devices. There is need for the school to hold fundraising ventures and use the money realized for procuring of ICT devices and assistive technology materials. There is need to have ICT classroom in the school.

The findings of the current study were partially similar to Mack et al. (1990) who carried out a study on computer training of learners with visual impairment and found that teachers of learners with visual impairment had poor or non-existent knowledge of specific areas of technology and concluded that teacher education programs have an obligation to train teachers in the necessary knowledge and skills to provide a bridge between learners and technology. The current study found more suggestion other than the need for teacher training in the area of ICT.

Some measures as indicated by Ahmed and Naveed, (2020), were that, the schools should endeavor to provide good rooms where the learners can access internet, have a smooth access to auditory devices and braille prints. The authors emphasized the need the room for ICT which this study also discovered.

According to Amponsah and Bekele, (2022) the findings indicate that the general policy frameworks are available in some institutions but they are limited in salience and significance as they do not consider the inclusion of learners with visual impairment in online learning and helping them in their daily experience with ICT. The current findings were similar to the discories of Amponsah and Bekele, (2022) because it also suggested the need for a policy and eventually a law on ICT learning.

According to Ryan, et al, (2016) the findings were that, educational institutions should strategically build the capacities of their staff concerning the ICT programs to better serve learners with visual impairment using online learning settings. This was a positive discovery which was similarly discovered by the current study.

In all these findings, Mundende's and Namafe' (2019) works emphasise that no learner should be left behind in the provision of instruction and equal opportunity should be provided to all learners, failure to which, learning may not take place.

CONCLUSION

In conclusion, learners with visual impairment describe their use of ICT in schools as a being positive transformative and empowering experience as well as challenging. JAWS was singled to be of great help as well as smart mobile phones. The learners with visual impairment had access to ICT devices such as computer smart mobile phones, braille display. They faced numerous challenges while learning using ICT such as lack of enough ICT devices, lack of trained ICT staff, lack of enough time for training due to limited time allocation for ICT on the main time table and having no room allocated for ICT. Other challenges were that, there was a problem of internet connectivity, insufficient software updates, limited availability of tactile graphics, complex website and accessible applications. Furthermore, other challenges experienced were that, some parents were lacking funds for purchasing gargets for their children and some teachers were not allowing learners to record their lessons. The researchers voice was that the, implication was that the learning and teaching of ICT skills was not smooth.

The study unveiled the following assistive technologies which were found at schools such as tape recorder, JAWS, braille display, voice command software, specialized keyboard, a computer installed with JAWS donated by a well-wisher and all assistive technologies helped learners with visual impairment to be independent learners. The researchers voice was that, the implication was that, the school made a great effort in ensuring the right ICT gargets were made known to learners with visual impairment.

The study found that impact of ICT on learning of learners with visual impairment was positive because they were able to access information and learning materials, do research and were able to learn such as writing than before. The researchers voice was that, the implication was that the availability of accessible digital resources, coupled the integration of specialized technologies with a supportive training despite having challenges allowed some learners to thrive academically and develop essential digital literacy skills that would serve them well even beyond their school years.

Basing on these findings the study made suggestions that, there is need to train teachers handling learners with visual impairment in the area of ICT. There is need to allocate extra time for ICT lessons and training in order for learners to improve on accessibility of academic information and usability of ICT skills which leads to positive academic performance. There is need of having enough ICT devices as opposed to having one computer against many learners. There is need for financial support to parents from social cash transfer and increased financial support to schools for easy procurement of ICT devices. There is need to have a policy and eventually a law in support of ICT accessibility and usability in educational settings by the government. There is a great need for school administrators to collaborate with other stakeholders who can assist learners with specific ICT materials and devices. There is need for the school to hold fundraising ventures and use the money realized for procuring of ICT devices and assistive technology materials. There is need to have ICT classroom in the school. The researchers voice was that, the study came up with the suggestions that aimed at addressing the challenges when accessing academic information by learners with visual impairment through ICT skills in order to boost their learning outcome.

The overall significance of this study

The overall significance of this study was that, the finding helped in understanding that, the main mode of communication which is braille can be replaced by ICT technology. The findings also helped in coming up with suggestions that could be used in the teaching and learning of ICT to learners with visual impairment

and help them to attain their ICT skills. The government through the Ministry of Education would benefit from this study because it would help them to explore their understanding on the experiences of using ICT that learners with visual impairment have had since its introduction in schools. The study provided the current status of ICT in secondary schools in relation to its use by the learners with visual impairment. Findings of the study could be useful to future studies with interest in examining further the effects of ICT on learners with visual impairment's learning. The study brought out the significance to the public on lessons that can be learned from experiences of learners with visual impairment in using ICT in schools.

Contributions to the existing knowledge

The study has contributed to the already existing knowledge about the aspect of ICT in the education sector. The study also contributed to the understanding of the relationship that exists between information technology in schools and the level to which the learners with visual impairment academically progress in schools through the acquisition of ICT skills.

RECOMMENDATIONS

In light of the research findings outlining the experiences of learners with visual impairment in utilizing ICT for educational purposes, the study presents the following recommendations for supportive digital learning environment:

i. There should be mandatory training programmes of ICT of teachers during their pre-service or in-service trainings by the government specifically for learners with visual impairment.
ii. There is need to allocate extra time for ICT lessons and training by the school authority in order for learners to improve on accessibility of academic information and usability of ICT skills which leads to positive academic performance.
iii. There is need of having enough ICT devices being provided by the government as opposed to having one computer against many learners.
iv. There is need for financial support to parents from social cash transfer and increased financial support from the government to schools for easy procurement ICT devices.
v. There is need to have a policy and eventually a law by the government in support of ICT accessibility and usability in educational settings.
vi. There is a great need for school administrators to collaborate with other stakeholders who can donate or assist learners with specific ICT materials and devices.
vii. There is for the school to hold fundraising ventures and use the money realized for procuring of ICT devices and assistive technology materials.
viii. There is need to allocate ICT classroom by the school administrators in the school.
ix. The parents should take responsibility of buying some of the ICT equipment for their children.

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