

LEARNER RELATED FACTORS THAT INFLUENCE ACCESS TO ICT BY LEARNERS WITH VISUAL IMPAIRMENT IN SELECTED SPECIAL SCHOOLS IN KENYA

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Abstract

Information Communication Technologies (ICT) are growing in availability and use. They are gradually being introduced to support various educational initiatives in schools with focus on communication. Information Communication Technology offers a potential to support lifelong learning for all groups of learners including those who have special educational needs. However, with the great emphasis placed on the importance of ICT in schools, little is known about the perception of learners with visual impairment towards the use of the new technologies in Kenya. The findings are significant for it will inform the policy makers in education on the ICT needs of learners with VI. The objective of the study was to find out learners related factors that influence access to ICT in special primary schools for visually impaired in Kenya. The study adopted descriptive survey method. The study targeted 3 public primary schools for learners with visual impairment and 750 learners in Kiambu, Meru and Mombasa counties. Purposive sampling, stratified random sampling and simple random sampling were used in drawing the samples. The samples consisted of 3 primary schools for learners with VI and 75 learners. Data collection instruments were questionnaires. Content validity was determined by seeking expert review. Split-half test of reliability was used to establish the reliability of the instruments. A correlation co-efficient of 0.75 was achieved. Quantitative data were analyzed using descriptive statistics. The study found that ICT enjoyed full support from learners with VI. It was seen as an essential tool in supporting education for learners with (VI). Learners concentrated during learning when using personal computers and they could learn more through incidental learning when using them. The study therefore recommended that the government through the ministry of education to provide more adapted computers and other relevant ICT materials to schools for learners with VI as they roll out the ambitious laptop campaign for standard one pupils in public primary schools to make them benefit from global knowledge thus making more included in the society.

Key Words: *ICT, Learners with visual impairment, Special schools*

I. Introduction

There are numerous international policies that are concerned with Information Communication Technology (ICT) and people with disabilities e.g. United Nations Conventions on the Rights of Persons with Disabilities (UNCRPD) (2006), which also adopted non-discrimination, equal opportunity, full and effective participation and accessibility among other issues. Information society must be created on the principles of social engagements i.e. involvement of all citizens regardless of their abilities, background, social status, ethnicity among others. Information Communication Technology has become the most suitable tool which can help people with different learning demands exercise their right to education, employment, social life, leisure, access to information and democratic channels. (UNESCO, 2006). Information and communication Technology has the potential to accelerate, enrich and deepen skills. It motivates

learners in learning and helps to relate school experiences to work practices; it helps to create economic viability for tomorrow worker; contributes radical changes in schools and strengthens teaching and provides opportunities for connection between institutions (Yusuf 2010).

Use of ICT has made learners develop greater pride in their work and tasks are completed on time. (UNESCO 2006), attest to the fact that ICT offers a potential to support lifelong learning for all groups of learners, including those who have special educational needs. The application of ICTs enhances independence, integration and equal opportunities for such people and in this way will facilitate their inclusion in society as valued, respected and contributing members. How ICT can be used in the most effective ways for education of people with disabilities is currently high on the political agenda of all countries, particularly those who have ratified the United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006). A number of the general principles included in the CRPD are directly linked to UNESCO's mandate. As the United Nations' leading agency for education, UNESCO is at the forefront of activities aimed at promoting quality education and lifelong learning for all society members including people with disabilities (European Union Agency Research 1999-2001).

As Africa confronts the various challenges of the 21st century, none is more important than creating competitiveness for our nations in the world economy. The process of globalization is irreversible and Africa must adapt to it in order to succeed (Medina 2002). Effective adoption and integration of ICT into teaching in schools in Ghana depends mainly on the availability and accessibility of ICT infrastructure and resources such as hardware and software (Buabeng 2012). Namibia recognizes that ICT can be used to enhance teaching and can facilitate inclusion of learners with Special Needs in Education (SNE). Namibia Training Authority (2006) indicated that there are barriers to the integration of ICT into inclusive settings that include attitudinal, administration, architectural, programmatic and training facilities. In Rwanda, Sabomana (2017) revealed that the level of integration of ICT in teaching and learning of science in lower public primary schools was low. The minimal use of ICT in Rwanda was influenced by inadequate abilities among the majority of science teachers and inadequate resources in most primary schools.

Information Communication Technology is a cross-cutting issue and requires heavy investments, ownership and commitment by all. In Kenya, integration of ICT in education is considerably more recent, small-scale and experimental. Most developing countries currently place emphasis on new dimensions, pedagogical approaches, teaching and learning that would enhance knowledge in interactive and self-directed ways. Information Communication Technology can play a role in preparing learners to acquire skills, competencies and socio-skills that are fundamental for competing in the emerging global 'knowledge' economy. Building of a civil society requires an increased access to knowledge and education. The right to education is an essential human need and a basic human right which is crucial to human development (MoE 2008).

The vision of Ministry of Education Science and Technology (MoEST) is to facilitate ICT as a universal tool for education and training. To achieve this vision, every educational institute, teacher, learner and the respective community should be equipped with appropriate ICT infrastructure, competencies and policies for usage and progress. It calls for recognition of the fact that ICT provides capacities and skills needed for a knowledge based economy and for transforming teaching and learning to incorporate new pedagogies that are appropriate for the 21st century. The mission of MoEST is to facilitate effective use of ICT to improve access, learning

and administration in delivering education programmes and services (MoEST 2006). In view of the above, it was necessary to carry out a study to determine learners with VI related factors that influence their access to ICT in selected special primary schools in Kenya.

II. Research Objective

To identify the learner with VI related factors that influence their access to ICT.

III. Research Question

What are the learner related factors that influence their access to ICT?

IV. Literature Review

The Learner Related Factors that Influence Access to ICT

Great emphasis has been put on the importance of ICT on the quality of teaching and learning. Therefore, it is only of essence to find out the perception of learners with VI towards the use of computers in learning. European Union Agency research on ICT in special needs (1999-2001), found that the educational needs of people with disabilities are extremely diverse. As with all members of society, people with disabilities must acquire the knowledge and skills required by the community in which they live for them to fit in. However, they face additional demand (often refers to as special educational needs) caused by functional limitations that impact in different ways upon their ability as learners to access standard educational progress and achievements. In this context, the application of ICT is very important for it plays an essential role in supporting high quality education for learners with disabilities. The advantage of ICT usage in the teaching and learning process is based on the possibilities it offers for alternative means of communication providing access to educational resources in a more convenient way and to enhance learning motivation.

Learners' perception about computers determines their use of these technologies as indicated by Waycott, Bennet, Palgamo and Kennedy (2010) who found that most learners are uncomfortable with computers and most of them indicated that using technology in their learning increase their work load. Some learners are unhappy about the lack of personal conduct and would prefer to learn in a more traditional mode (Shaw & Marlow 1999). According to Kopha (2012), the learners' age, accessibility to computers and limited familiarity with technology are the major stumbling block in technology integration. Learners perceptions and attitudes towards ICT in assessment indicate that they preferred a computer based examination and most were positive about their ICT skills while majority perceived that they lacked experience with computer-based examination (Chia, 2012).

However, earlier studies do not cover the perception of the learners with VI in the use of ICT that may influence ICT access but rather covers the learners' apparent perceptions. The present study has focused on the perceptions of learners with VI factors that influence access to ICT. Nevertheless, the study does not cover the use of the learner attitudes even after they have had access to ICT resources which may not clearly outline the determinants.

Diffusion Innovation Theory by Rogers (2003) was put forward to support the study. Diffusion innovation theory seeks to explain how, why and at what rate new ideas and technology spread. Rogers argues that diffusion is a process by which an innovation is communicated over time among

the participants in a system. It explains how over time an idea or product gains momentum and diffuses or spreads through specific population of a social system. The new result of this diffusion is that people as part of a social system adopt a new idea, behavior or product. According to Rogers, adoption of a new idea does not happen simultaneously in social system, rather it is a process where some people are more apt than others. Rogers proposed that there are four main elements that influence the spread of a new idea; the innovation itself, communication channels, time and a social system and all the entire process relies heavily on human capital. The theory was suitable for this study because it seeks to explain how, why and at what rate a new technology spread. The main argument of this theory is that for adoption of a new technology to take place, the person must perceive the idea as new or innovative. Therefore, special schools with learners with VI must view ICT as innovative to embrace it.

V. Methodology

The study adopted descriptive survey research design. A descriptive survey design was appropriate for this study since survey studies are conducted to determine the status quo and are concerned with gathering facts rather than manipulation of variables. In literal sense, descriptive research is used to describe situations or events, for example, it can be used to establish community needs and report of test score. In a school it is often used in educational research (Burns, 2000). The study targeted three public special primary schools for learners with VI and 750 learners in Kiambu, Meru and Mombasa counties. Purposive sampling, stratified random sampling and simple random sampling were used in drawing the samples. The sample consisted of three primary schools for learners with VI and 75 learners with VI. Data collection instruments were questionnaires. Content validity was determined by seeking expert review from members of the special needs department. The instruments were submitted to experts iteratively for consideration and their suggestions on different items used to refine them and increase validity. Split-half test of reliability was used to establish reliability of the instruments. The questionnaires were further refined after pilot study was conducted in one school in order to improve comprehensibility, relevance and clarity of the instruments. A correlation co-efficient of 0.75 was achieved which indicated a high level of internal consistency. The closer the alpha is to one (1) the higher the level of consistency. Quantitative data were analyzed using descriptive statistics while qualitative data were organized into themes and presented using descriptions and quotations.

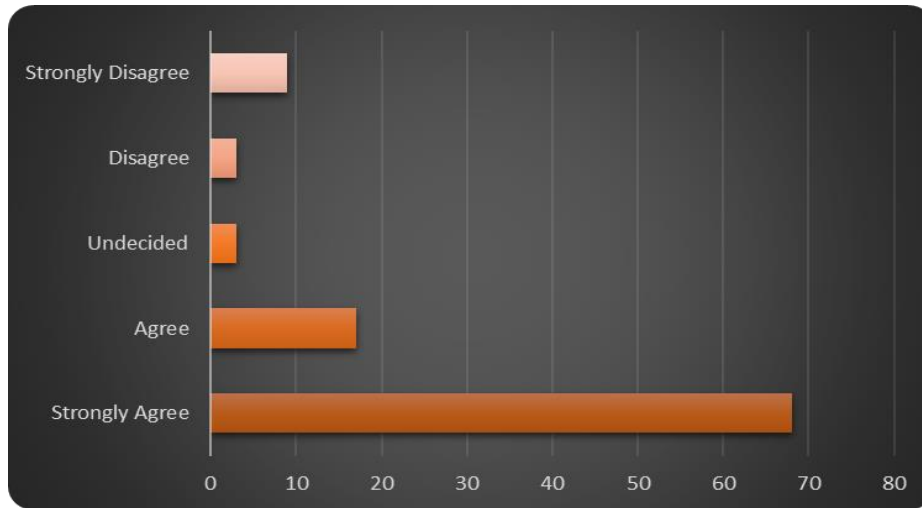
VI. Findings and Discussion

Learners with VI Related Factors that Influence their Access to ICT

The researcher sought to establish the learner-related factors that may influence access to ICT. A five-point Likert scale with the responses: Strongly Agreed (SA), Agreed (A), Undecided (U), Disagreed (D), and Strongly Disagreed (SD) was used to determine the learners' related factors.

Students views on ICT Knowledge Worthwhile

The researcher sought to establish from the learners whether knowledge on the use of ICT resources was a worthwhile skill. The findings are as illustrated in Figure 1:



(Percentages)

Figure 1: ICT Knowledge Worthwhile

As indicated in Figure 1, majority of the respondents 64(85%) agreed with the statement that, to know how to use ICT resources is a worthwhile skill while 9(12%) disagreed and 2(3%) were undecided. This indicated that learners with VI supported the new technology and it is a welcome idea. The findings are in agreement with MoE (2006) which observed that ICT can play a role in preparing students' competencies and socio skills that are fundamental for competing in the emerging global 'knowledge economy.' This shows that the learners with VI perceive ICT as very essential in supporting their education. This in turn makes them fit into the global 'knowledge' economy.

Learning Computers Takes Time

The researcher sought to establish whether learning of computers took a lot of time. The findings are presented in Table 1.

Table 1: Learning Computers takes time

Response	Frequency	Percentage
Strongly Agree	14	18.7
Agree	15	20
Undecided	11	14.6
Disagree	18	24
Strongly Disagree	17	22.7
Total	75	100

The researcher established that almost half of the learners 35(46.7%) disagreed with the perception that learning computers took a lot of time while 29(38.6%) agreed with the statement. The other 11(14.6%) were undecided. The findings indicated that most of the respondents did not find learning computers taking a lot of time. Respondents also claimed that learning computers took a deserved short time. However, a group of respondents were not very comfortable using ICT. This latter finding was in agreement with the study carried out by Waycott, Bennet, Palgamo, and

Kennedy, (2010), on 99 undergraduate students, which showed that most students are uncomfortable with computers.

Incidental learning while using Computers

The researcher sought to establish whether learners with VI could learn many new things when using computers. The findings are presented in Table 2 below.

Table 2: Using computer to learn many things (Incidental learning)

	Frequency	Percent
Strongly Agree	48	64
Agree	18	24
Undecided	4	5.3
Disagree	1	1.3
strongly disagree	4	5.3
Total	75	100.0

As indicated in Table 2, the study established that majority of the respondents 66(88%) agreed to the statement that they could learn many new things (incidental learning) when using computers. Another 5(6.6%) disagreed with the statement while 4(5.3%) were undecided. These findings are in agreement with those of Castro *et al.*, (2011) who found that students are now more frequently engaged in the meaningful use of computers for they build knowledge through accessing, selecting, organizing and interpreting information and data.

Computers Improve Learning

The researcher sought to establish whether respondents agreed that computers can improve learning. The findings are presented in Table 3 below.

Table 3: Computers improving learning

	Frequency	Percent
Strongly Agree	44	58.7
Agree	20	26.7
Undecided	6	8
Disagree	2	2.6
strongly disagree	3	4
Total	75	100.0

Majority of the respondents 64(85.4%) strongly agreed that computers can improve learning. Another 5(6.6%) disagreed with the statement while 6(8%) were undecided. The majority agreed with the statement since the machines had software that were educative and interactive to the learner advantage. Most of the sentiments that they gave to support their views were informed reliably. It was concluded that students not only acquire knowledge together, but also share diverse learning experiences from one another in order to express themselves and reflect on their learning needs. This concurs with the findings that computers can improve independent access for students to education (Moore & Taylor, 2000), Students with special learning needs are able to accomplish

tasks working at their own pace (ACE Centre Advisory Truth, 1999), Visually impaired students using the internet can access information alongside their sighted peers (Waddell,2000).

Learning More Through Computers

The researcher sought to establish whether learners learned more when using computers and the findings are presented in Table 4 below.

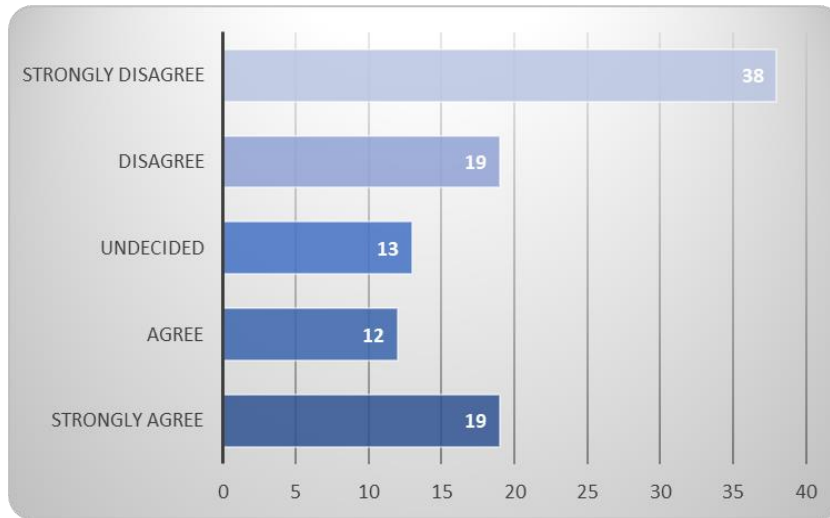
Table 4: Learning more through Computers

Response	Frequency	Percentage
Strongly Agree	48	64
Agree	18	24
Undecided	4	5.3
Disagree	1	1.3
Strongly Disagree	4	5.3
Total	75	100

The study established that most of the respondents 66(88%) strongly agreed that they could learn more things when using computers as they were so informative and helped them learn more things which they never intended. 5(6.6%) disagreed while 4(5.3%) were undecided. Most of the respondents strongly agreed that access to the use of computers allowed the learners to learn more things. Among the aids which helped in learning many things was the use of the internet which led to acquiring a lot of information. The learners agreed that before the computers became accessible to them, learning was limited to teachers' instructions. The findings are in agreement with those of Chai, Koh and Isai (2010) who found that ICT provides more creative solutions to different types of learning inquiries. They further found that learners can access all types of texts from beginning to advanced levels with ease through computers, laptops, personal digital assistants (PDAs) or iPads more specifically, these e-books may come with some reading applications, which offer a reading-aloud interface, relevant vocabulary-building activities, games related to reading skills and vocabulary acquisition and more.

Frustration Using ICT

The researcher sought to establish whether using ICT was frustrating to the learners with VI. The findings were as illustrated in Figure 2:



(Percentages)

Figure 2: Frustration using ICT

The researcher established that slightly over a half of the respondents 42(56%) disagreed to the view that using ICT is very frustrating, while 23(31%) agreed that there was frustration in using ICT resources and 10(13%) were undecided. A higher rate of the learners opposed the notion that using ICT resources was frustrating. This could be because of frequent access to computers at school that has made them more conversant with the use of the technologies and therefore they don't get frustrated when using them.

Working with computer is Fun

The researcher sought to establish whether it was fun to Figure out how computers work. The findings are presented in Table 5 below.

Table 5: working with computer is fun

Response	Frequency	Percentage
Strongly Agree	24	32
Agree	27	36
Undecided	7	9.3
Disagree	9	12
Strongly Disagree	8	10.6
Total	75	100

As indicated in Table 5 above, two-thirds of the respondents 51(68%) agreed that it was fun to figure out how computers work since it was a new experience in the learning process especially for the learners with VI, 17(22.6%) disagreed while 7(9.3%) were undecided. Over two-thirds of the respondents were in agreement that figuring out how computers work was fun and they consequently enjoyed classes more. The use of commands on the keyboard and the mouse coupled with the display was fun. This confirms studies done by Waddell (2000), that established increased ICT confidence amongst students motivates them to use the internet at home for schoolwork and leisure. It is clear that learners with VI are accessing the new technologies and are embracing them.

Stimulation Using Computers

The researcher sought to establish whether working with computers was both enjoyable and stimulating to the learner. The findings are illustrated in Figure 3.

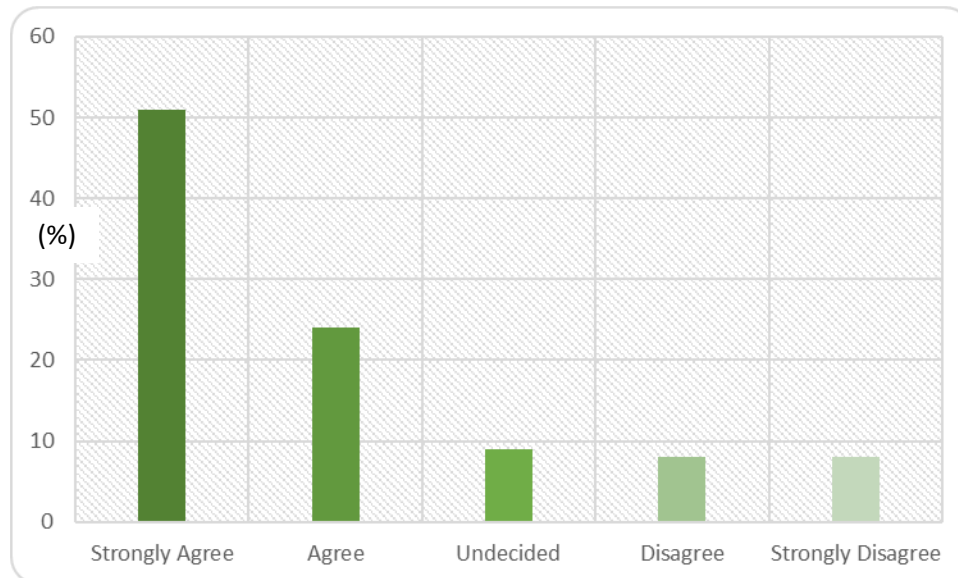


Figure 3: Stimulation using computers

The researcher established that almost three-quarters 55(74%) of the respondents agreed that working with computers was enjoyable and stimulating, 7(9%) were not sure while 13(17%) disagreed with the statement. About three-quarters of the respondents agreed to the thought that working with computers was enjoyable and stimulating, a fete which they have discovered with their interaction with computers. These findings are in agreement with Worth (2001) who found that students using voice communication aids gain confidence and social credibility both at school and within their communities

Concentration When Using Computers

The researcher sought to establish whether learners concentrated while using computers. The findings are illustrated in the Figure 4:

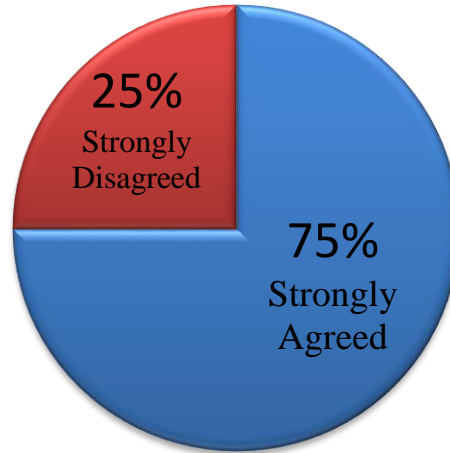


Figure 4: Concentration Using Computers

The researcher established that three quarters of the respondents 56(75%) agreed that they have concentration with computers when using them while one quarter 19(25%) disagreed they ever concentrated but rather scrolled through the monitor to see the available displays. A higher percentage of the learners who were eager to engage with the new technologies in their learning strongly agreed they concentrated with the computers they were using as they were exciting aids in learning. This indicates that learners with VI need to be given ample time to interact with the computers. These findings are in agreement with Detheridge, (1997) who found out that students with profound and multiple learning difficulties can communicate more easily.

Difficulty in Using ICT Technology

The researcher sought to establish whether learners faced difficulties while using ICT technology. The findings are illustrated in Figure 5:

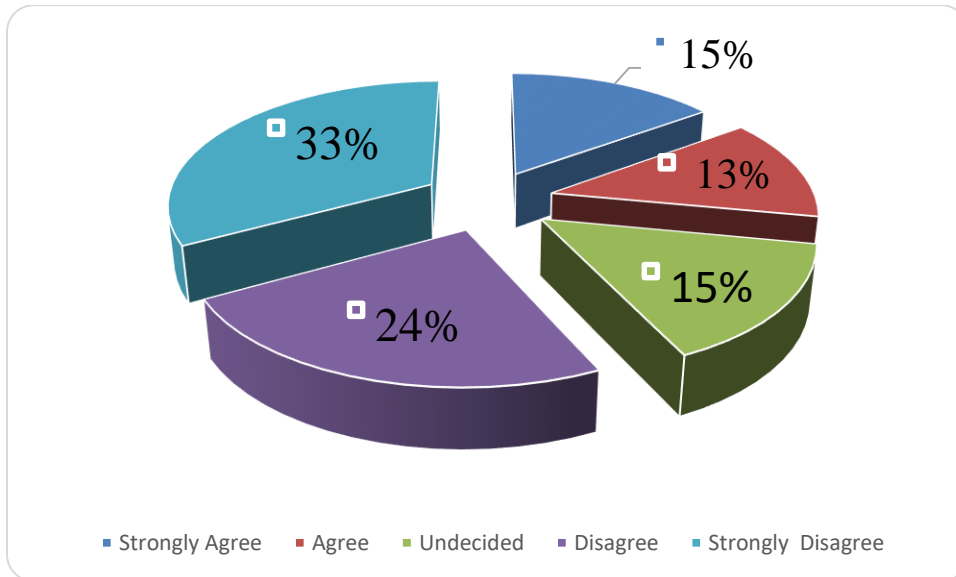


Figure 5: Difficulty in Using ICT Technology

As indicated by the findings, more than a half of the respondents 43(57%) disagreed with the view that ICT resources are difficult to use, 21(28%) agreed, while 11(15%) were undecided. From the findings, more than half of the learners disagreed that there is difficulty in using ICT resources. They found it easy to use the availed resources and were very excited to be given access to the same. This indicates that the learners have knowledge on how to use ICT resources because they have been taught on how to use them. This finding are in agreement with Ministry of Education (MoE) (2008) who observed that whereas the impact of ICTs on educational goals is still inconclusive, reported observations around the globe include rapid expansion of knowledge, improved examinations outcomes, enhanced communication and technical efficiency as well as greater decentralization in the delivery services.

ICT Help at Home

The researcher sought to establish whether access to ICT at home helped learners in skills development. The findings are as presented in Table 6 below;

Table 6: ICT helps at Home

Response	Frequency	Percentage
Strongly Agree	31	41.3
Agree	18	24
Undecided	5	6.6
Disagree	8	10.6
Strongly Disagree	13	17.3
Total	75	100

The researcher established that slightly two-thirds of the respondents 49(65.3%) agreed that ICT access at home had helped learners in development of skills since a lot of what they got while in school could be practiced at home and hence become perfect, 21(27.9%) disagreed, while 5(6.6%) were undecided. About two-thirds of the learners agreed that having computers at home helped in

developing their skills since they operated the computers without being given directions and were prone to messing and correcting themselves until they ended up becoming good in using computers. The findings concur with the research by Waddell (2000) who found that increased ICT confidence amongst students motivates them to use the internet at home for schoolwork and leisure. It is clear that learners who access computer at home sharpen their computer skills and thus become more confident in the use of the new technologies.

ICT Access at Home

The researcher sought to establish the level of access to ICT at home for the VI learners and the findings are presented in Table 7.

Table 7: ICT Access at Home

Response	Frequency	Percentage
Strongly Agree	14	18.6
Agree	16	21.3
Undecided	6	8
Disagree	16	21.3
Strongly Disagree	23	30.6
Total	75	100

As indicated in Table 7, slightly over half of the respondents 39(51.9%) disagreed that they had ICT access at home while 30(39.9%) agreed they had the same at home and 6(8%) were undecided. The findings indicated that the level of access of ICT at home was lower to the level of inaccessibility of the technology. The findings are in agreement with Kahn (2007) who found that 80% of all people with disabilities in the developing world live in what can be considered poor living conditions and therefore among the worlds' poor and thus cannot afford to buy or even access the new technologies.

Computer Access at School

The researcher sought to establish whether learners with VI had computer access while in school. The findings are as presented in Table 8 below;

Table 8: Computer access at school

Response	Frequency	Percentage
Strongly Agree	31	41.3
Agree	24	32
Undecided	3	4
Disagree	9	12
Strongly Disagree	8	10.7
Total	75	100

Research findings established that slightly below three-quarters of the respondents 55(73.3%) strongly agreed that they learnt computers at school, 17(22.7%) disagreed while 3(4%) were undecided. This showed that the learners with VI had a greater access to computers at school. This

was a positive departure from the earlier perception that computers were not very useful tools to learners with VI. About three-quarters of the learners were in agreement that they learnt computers at school and were really appreciative of it. The findings are in agreement with the research carried out by Coudie, (2007) which indicated that the extent to which schools are in a position to implement and take advantage of ICT in learning and teaching depends on development across a number of dimensions relating to infrastructure including school policy, resources, teacher confidence and capacity, connectivity, security, and management of the system.

Convenience Using Computers

The study sought to establish whether the learners with VI felt that using computers was more convenient. The findings are as illustrated in Figure 6.

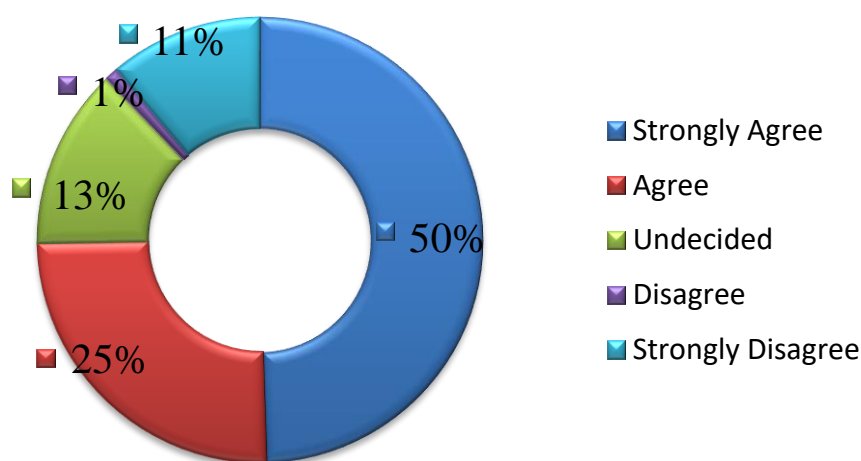


Figure 6: Convenience using computers

The researcher established that three-quarters of the respondents 56(75%) agreed that they believed using computers was more convenient for them since it was fast, neat and presentable to the reader. Some 10(13%) were undecided while 9(12%) disagreed. About three-quarters of the learners believed that using computers was more convenient for them. This indicates that learners with VI are happy with the new technologies because they will not struggle with braille writing and they can work at their own pace. This concurs with the findings of Waddell, (2000) who found out that students with visual impairment using the internet can access information alongside their sighted peers; and students with profound and multiple learning difficulties can communicate more easily (Detheridge, 1997). This spells the fact that learners with VI find the use of computers convenient.

ICT and Keeping in touch

The researcher sought to establish whether ICT helped the learners to keep in touch and the findings are illustrated as in Figure 7.

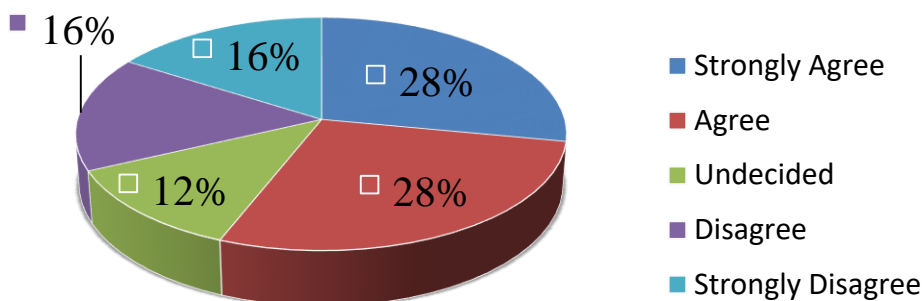


Figure 7: ICT and keeping in touch

The researcher established that a better rating 42(56%) of the respondents strongly agreed that ICT helped them in keeping in touch with the teachers and peers which made it easy to socialize and even get to ask their teachers questions even from a distance and receive answers. They also said that ICT helped the learners in keeping in touch with peers while 24(32%) disagreed with the view and 9(12%) were undecided. From the findings, majority viewed ICT as a social tool towards better integration and great knowledge acquisition. The findings are in agreement with Waddell (2000) who found that increased ICT confidence amongst students motivates them to use the internet at home for schoolwork and leisure interests among these being keeping in touch between themselves and even their teachers.

VII. Conclusion

The study established that ICT enjoyed full support from learners with VI and were ready to adopt and embrace new ways of learning through computers. Learners with VI concentrate more in learning when using ICT thus making learning more exiting for them. ICT also makes them learn many things through incidental learning via the software that is educative and interactive to the learners. It is therefore logical to conclude that ICT is fully welcomed by learners with VI and it will go a long way to make them more included in the society.

VIII. Recommendation

The study recommends that the government through the Ministry of Education to consider buying adapted computers to be installed in schools for learners with VI as it rolls out the ambitious laptop campaign in public primary schools in the country to increase their accessibility to ICT and make them benefit from the global knowledge. This will make them more included in the society.

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