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

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Abstract

The current implementation of ICTs in schools is irreversible. Teachers being implementers of any change in the education sector need to adopt ICT into classrooms for they play an important role in learning and teaching paradigm shift. They must understand the potential role of technology in education and they should become effective agents to be able to make use of technologies in the classroom. However, with the great emphasis put on the importance of ICT implementation in schools, little is known about teachers' attitude and preparedness in adapting to the new ways of learning and teaching. The objective of the study was to find out teacher related factors that influence access to ICT by learners with VI in schools. The study adopted descriptive survey method. The study targeted 3 public primary schools for learners with visual impairment and 80 teachers in Kiambu, Meru and Mombasa counties. Purposive sampling and stratified random sampling were used in drawing the samples. The samples consisted of 3 primary schools for learners with VI and 9 teachers. Data collection instruments were questionnaires. Content validity was determined by seeking expert review from members of the special needs education department. The instruments were submitted to experts iteratively for consideration and their suggestions on different items used to refine them increase validity. Split-half test of reliability was used to establish the reliability of the instruments. A correlation co-efficient of 0.75 was achieved which indicated a high level of consistency. Quantitative data were analyzed using descriptive statistics. The study found that ICT enjoyed full support from the teachers. It was seen as an essential tool and instructional aid in supporting teaching and learning. It was seen as a relief to teachers and it made them better professionals. However, majority of the teachers were for the view that they needed more training to allow them have confidence in the integration of ICT in teaching and learning. The study recommended that more training of teachers on new technologies was essential.

Keyword: ***ICT, Learners with visual impairment, Special schools***

I. Introduction

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). Research by Newhouse (2002a), on impact of ICT in Western Australia, found that ICT impacted on the quality and quantity of teaching, learning and research in traditional and distance education institutions around the world. In concrete term, ICT literacy has enhanced teaching and learning through its dynamics, interactive and engaging content, and has provided real opportunities for the individualized instruction. According to Coudie et al. (2007), the body of evidence on the impact of ICT on intermediate outcomes such as motivation, engagement with the independence in learning is greater and more persuasive. The benefits identified in the literature include increased collaboration, greater engagement and persistence more on task behaviour and better conceptual understanding.

In Africa, the study by Buabeng (2012) in Ghana revealed that effective adoption and integration of ICT into teaching in schools depends mainly on the availability and accessibility of ICT infrastructures and resources such as hardware and software. On the other hand, the study by Ngwu (2014) in Nigeria found that there were enough ICT resources but the use of ICT in teaching and learning was low.

Namibia recognizes that ICT can be used to enhance teaching and learning and can facilitate inclusion of learners with SNE. A research by Namibia Training Authority (2006), indicated that there are barriers to the integration of ICT in inclusive settings. These barriers are attitudinal, administrative, architectural, programmatic and training of facilitators. These findings indicate that for ICT integration to be effected in inclusive setting, these barriers must be removed because they are determinants of ICT integration. In Rwanda, the study by Sabomana (2017) revealed that the level of integration of ICT in teaching and learning of science in lower public primary schools was low. Which imply that the use of ICT in teaching and learning was minimal. The minimal use of ICT was influenced by inadequate ICT abilities among the majority of science teachers and inadequate resources in most primary schools.

Studies by Makanda (2017) on the use of ICT in teaching in secondary schools in Kenya found that physics teachers have a positive attitude towards use of ICT but barriers such as inadequate skills to integrate physics lessons and insufficient time to plan for ICT integrated lessons among others could be a hindrance. Also revealed is inverse correlation between ICT use and teaching experience. This means that ICT use falls with teaching experience and that younger teachers integrated ICT in their teaching more than experienced teachers. In addition, Alma (2014) asserted that ICT integration in classroom instruction in Kenya is constrained due to lack of adequate training and refresher courses for teachers, inadequate resources and inadequate support from technicians and administration. Biwot (2012), cited the following as determinants of ICT access in Kenya secondary schools; capability of the implementers i.e teachers, head teachers and education officers, availability of materials and resources, positive attitudes of teachers and learners, existing school setup and supportive school management. With the great emphasis put on the importance of ICT implementation in schools, and teachers being the implementers of any change in the education sector, it was of interest to carry out a study to establish the teachers' related factors that influence access to ICT by learners with VI in their schools.

II. Research Objective

To establish the teacher-related factors that influence access to ICT by learners with visual impairment.

III. Research Question

What are the teacher-related factors that influence access to ICT by learners with visual impairment?

IV. Literature Review

Teachers Factors that Influence ICT access.

Teachers are the implementers of any change in education sector. Fullan, (1982) pointed out that the quality of education and learning heavily depends on a competent teacher. Law and Chow

(2008) reported that competence was the best positive predictor of the teachers' adoption of ICT into classroom. Therefore, the teachers must understand the potential role of technology in education and should become agents to be able to make use of technology in the classroom. The proliferation of technologies has complicated the teaching learning process and finding the best ways of integrating technology into classroom practices is one of the challenges of the 21st century teachers face (Barker, 1999). Anderson and Dexter (2000), indicated that teachers need to know exactly how ICT is used as a teaching and learning tool.

Unal and Ozturk (2012) study on "Barriers to ICT integration into teachers' practice: A case on social studies teachers in Turkey" analyzed difficulties and obstacles faced by teachers of social studies education while using ICT-based teaching equipment and methods in the classroom. Eighteen teachers of social studies education participated in the study. Classroom observation and semi-structured interviews were used to collect data. The results indicated that the main barriers to the use of ICT-based methods and equipment in teachers' instructional practices are lack of ICT equipment in the classrooms, lack of ICT-based teaching resources, the effect of traditional approaches on teachers' practices, inadequate in-service teacher training and lack of time. The above study indicate that provision of ICT equipment, teaching resources, adequate in-service training for teachers, more time and change in traditional approaches on teachers` practices are the main determinants to teachers` use of ICT- based teaching equipment and methods.

Studies by Stronge, Tucker and Hindman (2004), found that when educators participate in professional development offerings that relate to their content area or population of learners they teach, it enhances their effectiveness resulting in higher levels of student success. The teachers' central role in the implementation of the curriculum has been further exposed by Katz (1989) who emphasized that there is a general agreement among specialists in the field that competence of the teacher is a central determinant of the quality and effectiveness of a programme. The implementation of new technologies in the teaching depends on the knowledge, skills and attitudes fostered during initial training. Indeed, teachers and teaching pedagogies must be close and constant. A Study by Schoepp (2005) indicate that the act of integrating ICT into teaching and learning is a complex process and one that may encounter a number of difficulties. These difficulties are known as barriers. Several studies have divided the barriers into two categories: extrinsic and intrinsic barriers. Ertmer (1999) as cited by Bingimlas (2009) referred to extrinsic barriers as first order and cited access, time, support, resources training and intrinsic barriers as second-order and cited attitudes, beliefs, practices and resistance.

Teacher Related Barriers

Several researchers indicated that teachers' lack of confidence is one barrier that prevents teachers from using ICT in teaching. Beggs (2000) asserted that teachers' fear of failure caused lack of confidence while Balanskat, Blamire and Kefala (2006) found that limitations in teachers' ICT knowledge makes them feel anxious about using ICT in the classroom and thus not confident to use it in their teaching. Lack of competence is another barrier. Al-Oteawi (2002), reported that teachers in the developing countries lack technological competence and is the main barrier to their acceptance and adoption of ICT. In Syria, teachers' lack of technological competence has been cited as the main barrier (Albarini, 2006). In Saudi Arabia, lack of ICT skills is a serious obstacle to the integration of technologies into science education (Albarini, 2006).

Resistance to change is another barrier to ICT integration in teaching and learning. Watson (1999) argued that integrating the new technologies into educational setting require change and different teachers will handle this change differently. Therefore, considering different teachers' attitudes to change is important because teachers' beliefs influence what they do in classrooms. Schoepp (2005) found that, although teachers felt that there was more than enough technology available, they did not believe that they were being supported, guided or rewarded in the integration of technology into teaching. According to Empiricas (2006) as cited by Bingimlas (2009), teachers who are not using new technology such as computers in the classroom are still of the opinion that the use of ICT has no benefits. According to Earle (2002), the change from a present level to a desired level of performance is facilitated by driving (encouraging) forces such as power of new developments, rapid availability, creativity, internet access or ease of communication while it is delayed by resisting (discouraging) forces such as lack of technical support, teachers' experience, or time for planning.

The Technology Acceptance Model (TAM) (2003) by Daves was put forward to support the study. Technology Acceptance Model is an information system theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it notably. According to Davis, the following factors influence the use of new technologies: Perceived Usefulness; this was defined as the degree to which a person believes that using a particular system would enhance his or her performance, perceived ease-of-use; he defined this as the degree to which a person believes that using a particular system would be free from effort, because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions towards trying to learn new technology prior to initiating effort directed at using. Technology Acceptance model suggests that when users are presented with a new information technology a number of factors determine their decision about how and when they will use 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 80 teachers. Purposive sampling and stratified random sampling were used in drawing the samples. The sample consisted of three primary schools for learners with VI and nine teachers in Kiamu, Meru and Mombasa counties. 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.

VI. Findings and Discussion

Teacher Related Factors that influence Access to ICT by learners with VI

The study sought to establish the teacher related factors that influence access to ICT by learners with VI. A five-point Likert scale with responses ranging from Strongly Agreed (SA), Agreed (A), Undecided (U), Disagreed (D) and Strongly Disagreed (SD) were used to determine the teacher-related factors.

Use of Computer is a Worthwhile Skill

The researcher sought to establish from teachers as to whether knowing how to use computer was a worthwhile skill. The findings are presented in Table 1.

Table 1: Using computers is a worthwhile skill

Opinion	Frequency	Percentage
Strongly Agree	6	66.7
Agree	-	-
Undecided	-	-
Disagree	3	33.3
Strongly Disagree	-	-
Total	**9**	**100**

The findings in Table 1, indicate that slightly above two-thirds 6(66.7%) of the respondents, agreed with the view that using computers was a worthwhile skill while the rest 3(33.3%) disagreed. From the findings, a higher percentage of the respondents favoured the use of computers to aid learning and found it so fulfilling to their career. This was rather a worthwhile skill that one had to have. Fullan, (1982) pointed out that the quality of education and learning heavily depends on a competent teacher. Thus, professional competence depended on how best a teacher was in his career which meant upgrading in ICT knowledge was really a worthwhile skill. It is clear from the above that teachers in schools of learners with VI value the use of computers in teaching thus a worthwhile skill to be acquired.

Computer as Instructional Aid

The results of teachers on use of computer as an instructional aid are presented in Figure 1:

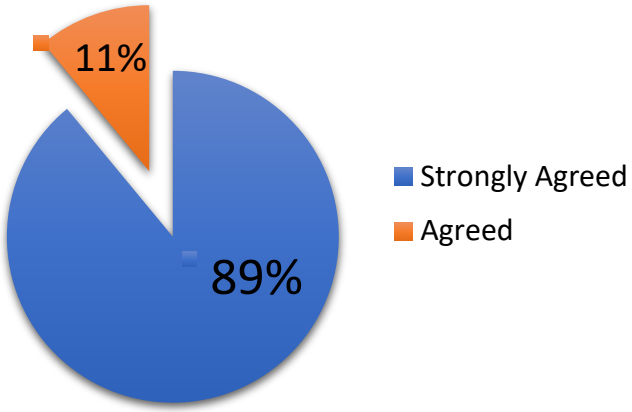

Figure 1: Use of computer

As indicated in the study, all of the respondents 9(100%) agreed that computers were useful as instructional aids in most of the subject areas. This indicates that the use of computers as teaching aids while teaching most of the subject areas was a welcome idea by the teachers. Teachers claimed that they preferred to use the machines due to their uniqueness and diversity and ease in displaying and explaining concepts though at times they face technical challenges. The findings are in agreement with Schoepp (2005) who found that, the act of integrating ICT into teaching and learning is a complex process and one that may encounter a number of difficulties. This clearly points to the usefulness of computers as instructional aid to learning.

Not Easy for learners with VI to Learn by using Computers

The results on whether learners with VI had difficulties when learning concepts using computers are summarized in Table 2.

Table 2: Not Easy for learners with VI to learn using Computers

Response	Frequency	Percentage
Strongly Agree	5	55.5
Agree	2	22.2
Undecided	0	0
Disagree	2	22.3
Strongly Disagree	0	0
Total	**9**	**100**

As indicated in Table 2, over three-quarters 7(79.7%) of the respondents agreed that learning using computers was not an easy fete while the rest 2(22.3%) disagreed. From the findings, it was evident that though the teachers were happy with the use of computers while teaching learners with VI, they admitted that it was not an easy fete for learners with VI to learn concepts using computers. The reason that may have contributed to this can be tied to time allocated for the lessons. The findings are in agreement with the findings of Sicilia (2005), who found that the most common challenge reported by all the teachers was lack of time to plan technology lessons, explore the

different internet sites or look at various aspects of educational software thus making teaching/learning in the classroom not easy.

Tension and Lack in Comfort

The results on whether teachers felt tense and uncomfortable while working with computers are presented in Table 3 below:

Table 3: Tension and lack of comfort

		Frequency	Percent
	Strongly Agree	4	44.4
	Agree	0	0
	Undecided	2	22.2
	Disagree	3	33.3
	strongly disagree	0	0
	Total	**9**	**100.0**

Results in Table 3 show that, almost a half of the respondents 4(44.4%) agreed with the view that working with computers made them tense and uncomfortable. About 3(33.3%) disagreed, while 2(22.2%) were undecided. The above findings indicate that knowledge of the technology was not adequate to most of them. They were found to be anxious and willing to try out the new technology even with their limited knowledge. The findings concur with the findings of Newhouse (2002), who found out that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching.

Computers Relieving Teachers

The results on whether computers relieved teachers of routine work are presented in Table 4 below.

Table 4: Computers relieving teachers

Response	Frequency	Percentage
Strongly Agree	2	22.2
Agree	5	55.5
Undecided	0	0
Disagree	2	22.2
Strongly Disagree	0	0
Total	**9**	**100**

The results indicate that over three-quarters of the respondents 7(79.7%) agreed that computers can relieve teachers of routine work while 2(22.2%) disagreed. As indicated, about three-quarters of the teachers found a lot of relief in their work after the introduction of computers. This was because a lot of what would have been done manually by visiting libraries could be done through downloads via computers. Some programmes like *Encarta Encyclopedia* proved too educative to both teachers and learners alike. The findings are in agreement with Castro, et al (2011) who found

that students are now more frequently engaged in the meaningful use of computers. They build new knowledge through accessing selecting, organizing and interpreting information and data.

Using Computers Makes Better Teachers

The results on whether using computers made teachers better proffesionals are presented in Figure 2:

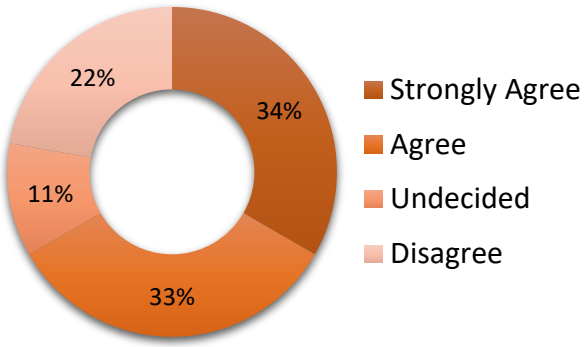

Figure2: Computer makes better teachers

The results indicate that almost two-thirds of the respondents 6(67%) agreed with the view that using computers in teaching made them better teachers, while 2(22%) disagreed. Only 1(11%) of the respondents was undecided. This indicates that about two-thirds of the teachers had experienced the great help they got in learning and using technology and therefore, were willing to have it as an aid to their work. The idea that machines are meant to make work easier is justified here due to the fact that class delivery was becoming an easy fete. The resources were helping in ensuring that learning by using computers did not just become another introduction in class which was just a vain innovation without any impact on learners with VI. The findings concur with (CRPD,2006) findings which indicated that when ICT is used effectively it enhances learning and hence education of people with disabilities. It is clear that teachers value the use of ICTs which they had realized that it made them better teachers.

Reduction of Contact

The results on whether the use of computers in education reduced personal contact with learners are illustrated in Figure 3:

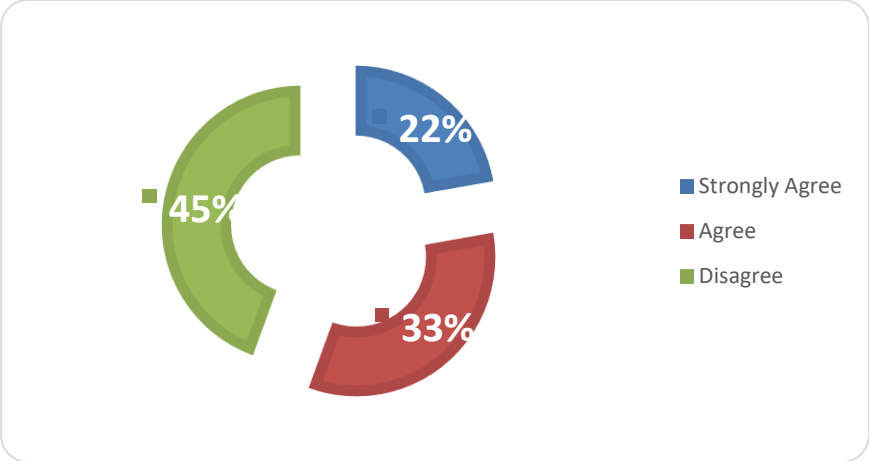

Figure 3: Reduction of Contact

The findings show that slightly above a half of the respondents 5(55%) agreed with the view that the use of computers in education reduced personal contact with learners while almost a slightly smaller percentage 4(45%) disagreed that the use of computers in education reduces personal contact with learners. Over a half of the respondents agreed with the view since the need to engage in technology had created minimal teacher-learner personal contact. To some level, it was also viewed that machines had taken the place of humans. This ultimately had reduced contacts between teachers and learners. These findings concur with those of Chia (2012) who found that students preferred a computer- based examination and most of them were positive about ICT skills.

Computers and Remedial

The results on whether computers could enhance remedial instruction needed by the learners with VI are presented in Figure 4:

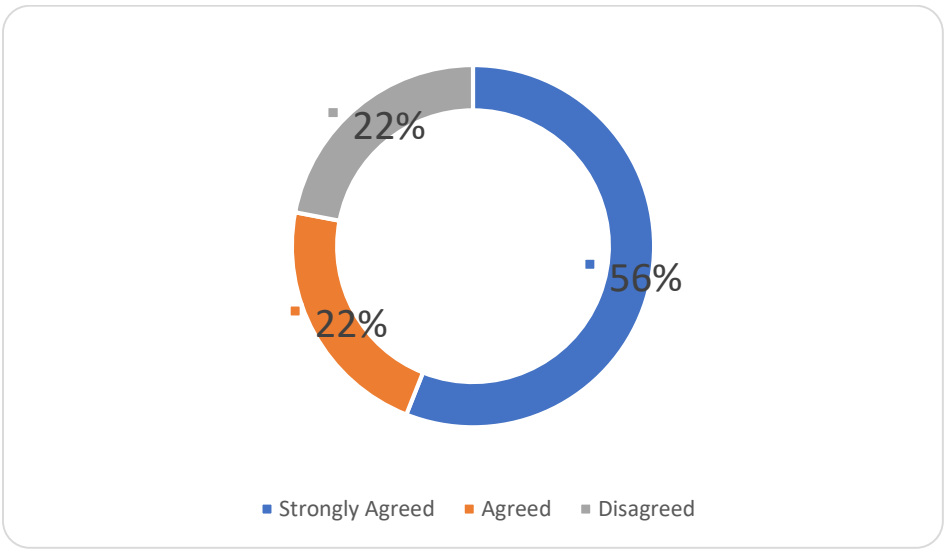

Figure 4: Computers and remedial

The results show that over three-quarters 7(78%) of the respondents agreed that computers could enhance remedial instruction needed by learners with VI, 2(22%) disagreed. From the findings, it was evident that teachers were of the opinion that computers could work greatly in enhancing remedial instruction. The finding is in support to the findings of Billowes (1999), as quoted in Murray and Compell (2000), who found out that access to the technology make learners carry out learning even in the absence of their teachers. The same improved access of the computers to teachers would help prepare remedial materials on time. From the findings it is clear that teachers embrace the use of computers for it enhances remedial work.

ICT Importance to Inclusive Practice

The results on whether ICT was an important aspect of inclusive practice are presented in Figure 5:

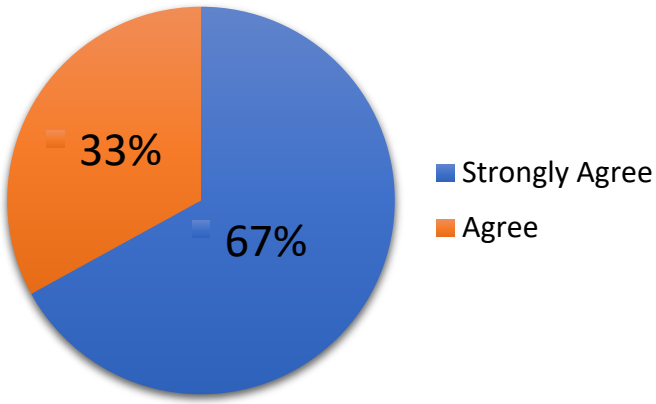

Figure 5: ICT Importance to Inclusive Practice

The results indicate that all teachers 9(100%) agreed that ICT was an important aspect of inclusive practice and that the view was an informed one since teachers and learners with VI were fully involved in the acquisition of knowledge. These finding is in agreement with the research findings by UNESCO (2006) who concluded that the ways to reduce barriers to inclusion involve increasing access, either physical, or through use of various accessibility settings available in computer. From the above it is a clear indication that ICT usage make learners with disabilities more included in the society.

ICT on Child Cognitive Development

The results on whether using ICT could enhance a learners' cognitive development are presented in Table 5:

Table 5: ICT on Child Cognitive Development

	Frequency	Percentage
Strongly Agree	6	66.7
Agree	3	33.3
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	**9**	**100**

The results in Table 5 shows that all the respondents agreed that using ICT could enhance learners' cognitive development. The teachers felt that due to numerous displays on the monitor, the child had an advantage of developing cognitive capability. The findings concur with Fu, (2013) who made a conclusion that ICT offers more opportunities in developing critical higher-order thinking skills in the learners. ICT also offered diversity in the teaching methods applied by teachers encompassing all learners. With inclusive education at its initial stages, integration of learners with VI can be greatly boosted if the learners and teachers embrace the technology with the positivity and seriousness it deserves.

VII. Conclusion

The study observes that all teachers were for the idea that computers are useful instructional aids in most of the subject areas although some teachers get tensed and lack comfort when using computers which is an indication that knowledge of the technology was not adequate to most of them. Majority of the teachers believed that use of computers relief them from routine work and make them better professionals therefore ready to embrace it. The study further revealed that teachers find ICT as an important aspect of inclusive practice because learners and teachers are fully involved in the acquisition of knowledge regardless of their disabilities.

VIII. Recommendations

The study recommends that the Ministry of Education should encourage teachers teaching in special schools of learners with VI to attend in-service courses on ICT to make them competent in the use and management of the adapted new technologies. The government through the ministry of education should ensure that ICT lessons are accorded enough time in the school timetables to enable teachers have enough time to prepare adequately thus avoid tension. The Ministry of Education should endeavor to include the teaching of ICT as a tool for teaching and learning in all levels of teacher training institutions in preparedness to embracing it during teaching thus making education more inclusive.

IX. References

1) Albarini, A. (2006). *Teachers' attitude toward Information and Communication Technologies. The case of Syrian EFL teachers Computer & Educatin 47,373-398.*
2) Alma, R. (2014). *Assessing Integration of Information and Communication Technology in Classroom instruction by Physics teachers in Nairobi County*. Unpublished Project. Kenyatta University.

3) Al-Oteawi, S. M. (2002). *The perception of administrators and teachers in utilizing information technology in instruction, administrative work, technology planning and self development in Saudi Arabia.* Doctoral Dissertation, Ohio University, Ohio.
4) Anderson, R. E.& Dexter, S. L. (2000). School Technology Leadership*: Incidence and Impact (teaching learning and computing:1998 National Survey Report #6).* Irvine, CA: Centre of Research on Information Technology and Organization, University of Califonia, Irvine.
5) Balanskat, A., Blamire, R. & Kefala, S. (2006). *A review of studies of ICT impact on schools in Europe*. European Schools net.
6) Barker, P. (1999). Using internet to support teaching and learning. *Innovations in Education and Training International 36(1), 3-10.*
7) Beggs, T. A. (2000*). Influences and barriers to the adoption of instructional technology paper preserved at the proceedings of the Mid-South International Technology Conference,* Murfreesbore, Tn.
8) Billowes, N. (1999). National conference Report: 02/12/1999. Available at *htt//www.tki.org.nz*
9) Bingimlas, K. B. (2009*). Barriers to the successful integration of ICT in Teaching ans Learning Environments:* A review of the literature. RMlt University, Bandoora, VIC, Australia.
10) Buabeng-Andoh, C. (2012). *Factors influencing teacher adoption and integration of Information Technology into teaching; A review of the literature. International journal of Education and Development using Information and Communication Technology 8(1)136.*
11) Burns, R. (2000**).** *Introduction to Research Methods. (4th Ed). London: Sage Publishers.*
12) Biwot, J. (2012). *Evaluation of factors influencing implementation of computer studies curriculum in Nandi Central District Public Secondary Schools.* University of Eastern Africa; Baraton. Unpublished Thesis.
13) Castro, J. J. & Aleman, EC; (2011). *Teachers opinion survey on the use of ICT tools to support attendance based teaching. Journal computers and Education. Vol. 56 .pp.911-915.*
14) Chia, S. (2012*). Learners and teachers Perceptions and Attitudes Towards ICT in Assessment.*
15) Coudie, R., Monro,B., Seagraves, L &Kenessons, (2007). *The Impact of ICT in schools – a lands cape review*. UK.
16) Davis, F. D. (2003). *Acceptance of Information Technology-Misquartely, 13(3), 319-339.*
17) Earle, R. S. (2002). *The integration of instructional technology into public education promises and challenges*. ET Magazines, 42(1), 5-13.
18) Empiricas, S. (2006). *Benchmarking access and use of ICT in European schools 2006. Final report from Headteacher and classroom teacher survey in 27 European countries.* European Commission.
19) Ertmer, P. (1999). *Addressing first and second order barriers to change: strategies for technology.* Integration educational technology research and development, 47(4) 47-61.
20) Fu, S. J. (2013*). ICT in Education; A Critical Literature Review and its implication*. National Institute of Education, Singapore.
21) Fullan, M. (1982). *The new meaning of Educational change London*: Cassel Educational Limited.

22) Katz, L. G. (1989). *Afterward: Young children in cross-national perspective in hoe young nations serves young children profile of childcare and education in 14 countries.* Michigan High/scope Educational Research Foundation.
23) Law, N. &Chow, A. (2008). Teacher Characteristics, Contextual Factors and How These Affects the pedagogical use of ICT. In Law, N., Pelgrum, W. J. & Plomp, T.(eds) pedagogy and ICPse. CERC.
24) Makanda, S. (2017). Use of ICT in teaching physics; a case of secondary schools in Kimilili District, Bungoma County, Kenya. Unpublished master's project. Kenyatta University.
25) Murray, D. & Compell, N. (2000). *Barriers to implement Information Technology in some New Zealand schools.* Computers in New Zealand schools.
26) MoE & Mo Higher Edu.Science and Technology, (2012). *Reforming Education and training sectors in Kenya. Sessional paper No.14.*Nairobi: Government Press.
27) Namibia Training Authority. (2006*). International Journal of Education and Development using Information Technology* (IJEDICT*). Vol 2. Issue 3. Pp70-85.*
28) Newhouse, P. (2002*). Literature review: The impact of ICT on learning and teaching,* Perth, Western Australia: Department of Education.
29) Ngwu, O. G. (2014*). Assessment of Availability and Utilization of ICT Resources in Teaching in FCE Eha-Amufu Enugu*, Nigeria.
30) Sabomana, A. (2017). *Determinants of Integration of Information and Communication Technology in teaching-learning of science in low public primary schools in Gasibo District, Rwanda.* Unpublished master's project, Kenyatta University.
31) Schoepp, K. (2005). *Berriers to technology integration in a technology rich environment, Learning and teaching in higher education; gulf perspectives, 2 (1),1-24.*
32) Sicilia, C. (2005). *The challenges and Benefits to Teachers; practices in constructivist learning environment supported by technology.* Unpublished master's thesis, McGill University, Montreal.
33) Stronge, J. H.,Tucker, P. D. & Hindman, J. L. (2004). *Handbook for qualities of effective teachers.* Virginia ASCD.
34) Unal, S. & Ozturk, H. (2012). *Barriers to ICT Integration into Teachers classroom practice: Lessons from a case study on social studies teachers in 2012.*
35) UNESCO IITE, (2006). *ICTs in Education for people with special needs; specialize Training course.*
36) UNHCRPD, (2006). *United Nations Conventions on the rights of persons with disabilities.*
37) Watson, G. (1999*). Barriers to the integration of the internet into teaching and learning: professional development*; paper presented at the Asia Pacific Regional internet conference on operational technologies.