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The Inclusion Of Students With Visual Impairment In Tertiary Institutions: A Case Study Of Teachers' Training College At Machakos, Kenya

Joshua Odhiambo Adongo,
Maseno University, Kenya; Jacomina M.C. Motitswe, University Of South Africa &Tlale LDN, University Of South Africa.

Abstract
The study investigated the inclusion of students with visual impairments (VI) in the tertiary institutions in Kenya; and contributes to the existing body of knowledge by highlighting challenges encountered by students with VI and lecturers. The findings of the study are likely to play a leading role in improving accommodation of students with VI in learning institutions. The study used symbolic interactionism theory and qualitative approaches that employed case study research design to collect data from participants drawn from Teachers' Training College based in Machakos County, Kenya. The study used open-ended qualitative questionnaire, semi structured interview, Focus Group Interview and infrastructural observation checklist to collect data from participants comprising of 3 administrators, 7 lecturers, 15 students with visual impairment (VI), 5 Students without VI and 2 support staffs of a tertiary institution. Qualitative data collected from the participants was analyzed by identifying words and phrases representing emerging themes. The study found that lecturers used varied methods to make curriculum accessible to students with VI such as preparation of hand-outs in Braille version; use of large prints; and preparation of tactile maps and diagrams. Also, the tertiary institution utilized varied assistive devices and ICT to enable students with VI access curriculum materials. However, the resources available for students with VI were overstretched by the existing number of students. But on the bright side, the study found that there was conducive social environment in the institution that supported students with VI. Finally, the researcher made varied recommendations on strategies that can be used to improve the inclusion of students with VI.

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I. Introduction

The last 50 years has witnessed a paradigm shift in the education of students with disabilities including those with visual impairment (VI) all over the world. The paradigm shift has been characterized by move to place and educate students with disabilities in inclusive classrooms rather than educating them in special classrooms (Francisco, Hartman & Wang, 2020). The momentum to embrace inclusive educational system by countries of the world has been precipitated by civil activism and endorsement and ratification of international agreements (Fanu,Schmidt & Virendrakumar, 2022). The international agreements that support inclusive education include: the Convention on the Right of the Child (CRC) in 1989, the Salamanca Statement (1994), the Dakar Framework for Action (2000), the Convention on the Right of Persons with Disabilities (CRPD) (2006) and the United Nations Summit on the Millennium Development Goal (MDGS) (2010) (Elder, 2015;Fanu,Schmidt & Virendrakumar, 2022).

The practice also referred to as inclusion is a philosophy that has been defined by scholars in varied ways. For instance, Francisco, Hartman and Wang (2020) defined inclusion as the practice of providing equitable opportunities to all students including those with severe disabilities to receive effective educational services with the aid of assistive devices and support services in age-appropriate classes in the neighborhood school that prepares them for productive lives as full members of the society. Accordingly, all students including students with significant disabilities are capable of learning and being productive in the society in one way or the other.

On the other hand, UNESCO (2023) defined inclusive education as an approach to education that takes into account individual student's needs and results into all students participating and achieving together in a learning context. The definition by UNESCO (2023) seems to acknowledge that all students are individuals with varied and unique characteristics, abilities, interest and learning needs. The philosophy of inclusion has also been defined as a process of addressing and responding to diversity of needs of all students through increased participation and reduction in exclusion in education (Hornby, 2015; Chauhan & Mantry, 2018).

The move to include students with disabilities in regular schools and classrooms has attracted both proponents and opponents in the society. The proponents of the debate argue that inclusive education provide students with disabilities with the opportunity to live and participate in the activities of the society as their regular peers (McCarthy & Shelin, 2017; Henkebo, 2018; Zelelew, 2019). Also, it is argued that inclusive education accords students with disabilities the opportunity to learn in a least restrictive environment of the regular schools which is a requirement of the law (Hornby, 2015). On the other hand, scholars opposed to inclusive education have argued that students with disabilities are best served in the environment with adequate resources that typically characterize most special schools (Papuda-Doliska, 2017).

Despite the varied reasons that has been advanced in support of inclusive education, the placement of students with disabilities including those with VIs in the regular schools require thorough and well-coordinated preparations if students with disabilities are fully to participate in all the activities of the regular institutions. Otherwise, mere placement with disabilities in the regular schools may alienate them from the activities of the regular school programs. Also, students with disabilities may fail to receive the appropriate and necessary support services. As a result, students with disabilities may fail to benefit from the regular classroom placement.

Kenya has not been left behind in the international trust to educate students with disabilities in the regular institutions. The introduction of Free Primary Education (FPE) by the government in 2003 is one policy that has had profound effect on inclusive education. The FPE implied that students were no longer required to pay school fee and other levies to attend school. Also, the government had committed itself to provide all students with learning and teaching materials. Consequently, the FPE has enabled thousands of children from poor families and vulnerable background including those with disabilities to attend schools (UNESCO, 2005).

The FPE had witnessed a marked increment in the gross enrolment of students in primary schools from 5.9 million to 7.6 million in 2003 (UNESCO, 2006). However, the FPE has been faced with several challenges such as teacher shortage, large classes and insufficient provision of teaching and learning resources (UNESCO, 2006). These challenges have adversely affected learning of many students especially those with disabilities who require individualized attention.

The data of students with disabilities in Kenya has for a long time remained incoherent, limited in quantity, quality and scope (KISE, 2018). However, MOEST (2016) had reported that Kenya has five special secondary schools, six special primary schools and

19 units in the regular schools serving most students with VI. In contrast a recent National Survey on the prevalence of children with disabilities and Special Needs Education in Kenya found that 671,205 children are visually impaired of which 596,701 (88.9%) were enrolled in inclusive and 66 special schools (KISE, 2018). On the other hand, there is limited empirical data on the number of students with VI enrolled in tertiary institution in Kenya. Therefore, studying the inclusion of students with VI in tertiary institutions is likely to shed more light on the varied challenges experienced by this cadre of students.

Purpose of the Study

The purpose of the study reported here was to investigate the challenges of including students with VI in tertiary institutions in Kenya; and formulate strategies to overcome them. It is anticipated that, there will be improved service delivery to students with VI in society.

Research Question

The research question addressed by the study was: What factors are influencing the inclusion of students with VI in tertiary institutions. Also, the study also addressed the following secondary questions:

1) What current strategies and resources are used by tertiary institutions to make curriculum accessible to students with VI?
2) What environmental modifications have been made in tertiary institutions to accommodate students with VI?
3) What policies exist in the tertiary institutions that guide the inclusion of students with VI
4) What strategies can be used to improve inclusion of students with VI in the tertiary institutions?

II. Methodology

The study adopted interpretivist research paradigm as well as qualitative research approach in order to study the perspectives participants regarding inclusion of students with VI in tertiary institutions. Also, it has embraced single case study design as has been explained in the subsequent paragraph.

Research Paradigm

This study embraced interpretivist research paradigm as the foundation on which the study is anchored. Also, the interpretivism research paradigm has subsequently determined the research approach, design and methods used to study the inclusion of students with VI in tertiary institutions. The philosophy of interpretivism put more emphasis on the way people construct meaning on a phenomenon in the social context. The idea has

been echoed by Rehman and Alharthi (2016) when they observed that the main goal of interpretivism is to enable researchers understand social phenomena in their context. In the context of this study, the inclusion of students with VI in the regular classroom is a new philosophy and practice in the education of persons with disabilities (McCarthy & Shelvin, 2017; Correa–Torres,Conroy, Rundle-Kahn & Brown-Ogilvie, 2018).

Research Approach

The study utilized qualitative research approach and a single case study design to study the inclusion of students with VI in tertiary institutions. Haradhan (2018) observes that qualitative research approach is a form of social action that stress on how people interpret and make sense of their experience to understand the social reality of the individuals. On the other hand, Eyisi (2016) states that qualitative research is a strategy that enables researchers to gain insight into how people construct reality about phenomenon as it is experienced, structured and interpreted by the people during their lives.

Accordingly, the study sought to get the opinion of lecturers, students with VI, and those without VI regarding their experiences with inclusion. The idea of Eyisi (2016) regarding qualitative research conforms with the opinion of Donoghue (2018) who observed that qualitative research provides participants with an avenue through which to examine the way people make sense of their concrete real-life experiences in their own mind and in their own words. On the other hand, Jameel, Shaheen and Majid (2018) posit that qualitative research is a systematic study that seeks to document individual perspectives, experience, thought and behaviour. This implies that individuals can construct meaning of situations through interacting with one another and the researcher must find out their subjective meaning of the situation based on their experience.

Research Design

The study adopted single case study design to explore the inclusion of students with VI the tertiary institutions in Kenya. Case study has been defined by scholars in varied by manners. Mugenda and Mugenda (2019) defined case study as empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between the phenomenon and the context are not clear, and in which multiple sources of evidence is used. On the other hand, Starman (2015) defined case study as in-depth exploration of multiple perspectives of the complex and uniqueness of particular project, policy, institution and program in real-life.

The case study design was appropriate for the study reported here in several ways. The interpretivist nature of the study allowed the researcher to interact with participants and get understanding and meaning of inclusion of students with VI in tertiary institutions (Rehman & Alharthi, 2016). Also, the research design helped in the exploration of a phenomenon within a particular context using a variety of data sources including but not limited to infrastructural observation checklist, semi structured interview, Focused Group Discussion and questionnaire. The use of multiple sources of data coupled with triangulation enabled the researcher to avoid biases. As a result, the researcher was able to understand multiple faces of inclusion of students with VI in tertiary institutions (Rashid et al. 2019). Thus, the research design allowed the researcher to gain in-depth insight on the inclusion of students with VI in the tertiary institutions.

Participants

The researcher adopted purposive sampling method to select appropriate sample size. The purposive sampling is defined as a sampling technique whereby the researcher selects participants in a deliberate way or with some purpose or focus (Kothari & Garg, 2019). A sample size of 32 participants comprising of 15 students with VI, 5 students without VI, 3 administrators, 7 lecturers and 2 support staff participated in the study. The support staff comprised of 1 Braille technician and 1 librarian. The participant held strategic positions within the institution and were likely to be conversant with issues that affect the academic performance of students including those with VI.

Site of the study

The study was done in Teachers' Training College involved in the inclusion of students with VI in Machakos County, Kenya.

Data Collection

The study used open-ended questionnaire, semi structured interview, Focused Group Discussion (FGD) and infrastructural observation checklist to collect data from the participants of the study. The use of open-ended questionnaire enabled the participants to provide their opinions, and views about the phenomena being studied. The open-ended questionnaire was filled by 15 students with VI, 10 students without VI, three administrators, five Heads of Departments, five lecturers and two support staff.

The researcher used semi- structured interview to collect data from a sample of 10 participants

comprising of five students with VI, two lecturers, one Head of Department, one regular student and one administrator. The use of semi- structured interview provided the researcher with the opportunity to cross examine participants regarding inclusion. Also, the researcher used (FGD) to collect data from a sample of eight students selected randomly from the students who had participated in the first round of the study. During the discussion, the researcher facilitated, moderated, monitored and recorded group interactions using a digital recorder as recommended by Punch (2014). The study also used infrastructural observation checklist to collect qualitative data on the buildings, physical environment, and facilities in the institution that accommodate students with VI.

Data Analysis and interpretation

Data analysis is the process of bringing order, structure and meaning to the mass of information collected from the field (Mugenda & Mugenda, 2019). The data derived from open-ended questionnaire were analyzed by identifying emerging themes and patterns (Mugenda & Mugenda, 2019). Secondly, the researcher transcribed the data derived from semi-structured interview and FGD by identifying the emerging themes and patterns by use of codes. Lastly, the data derived from open-ended questionnaire, infrastructural observation checklist, semi structured interviews and FGD was later triangulated to gain rich and clear understanding of inclusion of students with VI in the tertiary institution.

III. Results And Discussions

The findings of the study reported here have been discussed under the following emergent themes: accessibility of curriculum materials by students with VI; the use of inappropriate methods of teaching students with VI as well as limitations of the resources available for students with VI. Other emergent themes included support by peers, lecturers and technical staff; policy on inclusion of students with VI in the tertiary institution and strategies of improving inclusion of students with VI.

Accessibility of curriculum materials by students with VI

The accessibility of the curriculum materials by students with VI is one of the findings that emerged from the study. The materials were made accessible to students with VI in many different forms that include reparation of the handout in Braille; use of large print and preparation of tactile maps and diagrams to teach the students with VI.

Preparations of the Hand outs in Braille.

Students with VI indicated that their lecturers prepared for them handouts in Braille to enable them access curriculum materials. One of the student participants remarked that:

"We are given handouts in Braille by our lecturers who liaise with the Braille transcriber to transcribe handouts from print to Braille. Occasionally, visually impaired students are given handouts in print when the Braille transcriber is not able to prepare them in Braille," (FGI Student 02)

The participants seemed to have recognized the need to provide students with VI with Braille version of the handouts, but the transcription could not be done since the transcriber had other duties. It is apparent that the Braille transcriber had a lot of work serving 21 students with VI. She was, therefore, not in a position to cope with all the transcription work in the institution. Probably the institution should consider employing another Braille transcriber to make it possible to serve the students with VI more effectively and efficiently. The participant lecturer stressed that:

"The institution should invest in low-vision based technologies; more refreshable Braille notetaker displays, to enhance easy access and storage of books and notes, considering how bulky braille paper is," (Q-open Lecturer 02).

The lecturer was not only acknowledging the essential role played by Braille in the education of students with VI but also recognizing the inability of the institution to prepare enough Braille materials for students with VI. Hence, the lecturer was convicted that the use of modern technology to produce Braille would help meet the deficit in Braille production. Also, the participant lecturers stressed the need for adopting the use of refreshable Braille to ease the need for storage as well as enhance access to reading materials.

Use of Large Print in Learning

The students with VI were also presented with curriculum materials in large print. The use of large print has enabled students with VI to access curriculum. Large prints were used during the assessment and normal learning sessions by students with VI. Thus, the use of large print not only enabled the students with VI to access the curriculum but also enabled them to learn like their sighted peers. That was alluded to by the sentiments of the following participants:

"The institution is able to enlarge print used by students with low vision, while they prepare

Braille for those who are blind," (Q-open Student 18).

"We have a photocopier machine that can easily prepare large print for students with low vision. It is not difficult to prepare large print materials," (SSI Adm 01).

The preparation of examination in large print makes it possible for students with low vision to access both examinations and other learning materials in large print format. The use of large print to prepare curriculum materials is not as laborious and tedious as preparing written text in Braille format. Thus, It is much easier for the tertiary institutions to avail curriculum materials in large print than in Braille. Moreover, preparation of text in large print does not require skill and expertise as compared to the knowledge and skills necessary for a competent Braille transcriber. A participant lecturer said that:

"We have a photocopier that can enlarge handouts for students with VI. You know print is easy to mark as compared to Braille," (SSI Lecturer 07).

The view of the participant reflects an experienced teacher of students with VI in an inclusive institution. According to the participant, dealing with students with low vision was far much easier as to compared to dealing with the blind students. In addition, the use of large print allows lecturers who cannot read Braille to mark the students' assignment without the script being converted from Braille into print. Large print plays a significant role in the education of students with VI (Klingenberg, Holkesvik & Augestad, 2019). Thus, tertiary institution should have equipment that enlarge curriculum materials into large for students with low vision.

Preparation of Tactile Diagrams and Maps

Students with VI were presented with adapted diagrams and maps. This made it possible for them to access curriculum materials during learning sessions. The participants made the following sentiments:

"Yes, the diagrams that we used during map reading and other subjects were tactile. Some were very good, but others were not. It all depends on the person that has made it," (SSI Student 04).

"The Braille transcriber always make tactile maps and diagrams for students with VI that they use during science and social studies lessons (FGI Student 03).

There are, however, other modalities of presenting learning materials for students with VI. The adaptation of the assessment modalities is one such form of adaptation. According to McCarthy and McGuckin (2018), the adaptation of assessment methods and learning materials is a serious consideration in the education of students with VI. McCarthy and McGuckin (2018) postulate that the standard examination procedures and formats are likely to pose a challenge to students with VI. Thus, there is need to adapt assessments methods used in tertiary institutions with students with VI.

The use of inappropriate methods of teaching students with VI

The use of appropriate methods of teaching is one way of making curriculum accessible to students with VI in tertiary institutions. The participants gave views concerning their experiences with methods of teaching used by lecturers in their institution. The participants said that:

"Our lecturers have a lot of content to cover within a short time, so they sometimes teach in a hurry and a student end up not understanding what is being taught," (Q-open Student 05)

"The lecture method of teaching used by most of our lecturers is not very appropriate for visually impaired students. In many cases, the lecturer is in hurry to cover the content and does not care whether you have understood or not. It up to you," (FGI Student 07).

The sentiments by the students indicated that the methods used by their lecturers were inappropriate for students with VI. The probable reason why the lecturers were not using the appropriate methods and strategies to teach student with VI, was most likely to be lack of skills and knowledge in the pedagogy of students with VI. The methods used by the lecturers to teach students are quite crucial for the success of the students in their studies. Some scholars have attributed to poor performance of students with VI in tertiary institutions to use of inappropriate methods to teach by lecturers (Sikanku, 2018; Penda, Ndhiovu & Kasonde-Ngandu, 2015). Thus, tertiary institutions need to induct their teaching staff to adopt appropriate methods of teaching students. This is important if students with VI to be fully accommodated in the tertiary institution.

Inability of Lecturers to Verbalize what is Written on the Board

One of the effective strategies used to teach students with VI is to provide them with auditory feedback on what the lecturer has written on the boards. This enables the students with VI to keep abreast with the lecture. Participant students made the following remarks:

"One of the mistakes the lecturers do when teaching students with VI is fail to verbalize what they are writing on the board. It becomes difficult for visually impaired students to follow," (Q-open Student 14).

"While they are teaching, I wish they could verbalize what they are writing on the board. Yes, even if they are using a projector though not many lecturers are using the projectors, verbalize what is on the

screen. Secondly, as the lecturers verbalize what is on the screen, they should move, because we are not many, move close to an individual learner with visual impairment and clarify the concept," (SSI Student 05).

According to Agesa (2014), when a person loses the sense of sight, he/she mainly rely on the sense of auditory to receive information from the environment. Hence, lecturers of students with VI must strive to verbalize what they are writing on the board to enable the students with VI to follow the lecture.

Limited Interaction between Lecturers and Individual Students with VI

The participants provided various views concerning individualized instructions provided to students with VI undertaking training in the institution. The students with VI said their lecturers did not involve them in the lesson. They observed that:

"They should really involve students with visual impairments because you find in a class, a visually impaired person is seated at the back, and they do not care. They do not even bother to ask if the student has tried to grasp what is being taught," (SSI Student 03).

The sentiment by the student clearly indicated that the lecturer was not paying attention to individual students with VI and so, the student felt isolated in the learning process and that they were being left behind. It is important for lecturers involved in teaching classes with students with VI to involve them in the lesson by asking them probing questions to ensure that they are not left behind. Also, the lecturer should ensure that the students with VI are actively engaged in the lesson.

A student with VI was of the opinion that their lecturers were using lecture methods of teaching which tended to isolate them. Lecture method of teaching does not actively engage the students in the lesson either by asking questions or allowing the students to ask questions. Therefore, the use of lecture method would leave the lecturer with less opportunity to engage with the students especially those with VI. The student participants observed that:

"The method used to teach the students is not bad. The students with visual impairments are actively involved. They take part in the lecture. I think they were particularly using the lecture method to teach most students. There are varieties of methods of teaching that lecturers use in their classes," (SSI Student 04).

The views by the students that most of the lecturers were using lecture method to teach students including those with VI reaffirms that lecturers had not embraced one-on-one instruction to teach students most of the time. The assertion that the lecturers were not using individualized methods to teach students including those with VI was alluded to by the sentiments of the following participants who said that:

"We have many students in our classrooms, so it is difficult to use individualized methods of teaching with our students. We mainly use the lecture method and where applicable we may use demonstration like in PE," (SSI Lecturer 04).

The statement by the lecturer depicted lack of knowledge and skills of teaching students with VI. The lecturer argued that large classes make it impracticable for them to individualize their teaching. Thus, when lecturers have knowledge and skills of teaching students with VI, it will enhance the delivery of curriculum to the students.

One-on-one instruction is a strategy in which a lecturer engages with individual student during the lesson by asking him/her questions on what is being learnt. The purpose is to find out whether the student has understood what is being learnt and areas where he/she experiences difficulties (Habulezi et al. 2016). The study reported here found that majority of the lecturers was not applying individualized instruction on students with VI. There was a possibility that the lecturers in the institution had a short time to cover the subject content hence, they were rushing to complete the syllabi. Also, there was a possibility that the lecturers were not conversant with appropriate knowledge and skills of teaching students with VI. Therefore, there is need to continuously induct lecturers into various strategies and methods of teaching students with VI.

Limited Exposure of Students with VI to Concrete Experiences

The best methods of teaching students with VI are those that will result into the students having concrete experiences of what is being learnt, and hence making learning meaningful. A student with VI complained that their Physical Education lecturer would demonstrate to other students how to execute a style of swimming without showing him the same style. He explained that:

"So, I used to ask, excuse me sir: what do you mean by this? So, it forced him to come to me and tell me, 'This is what I mean. I am trying to explain using the gestures." So that was one of the challenges," (SSI Student 06).

The same sentiments were made by a student with VI who felt that there were a lot of concepts that the lecturers discussed in class which they had limited understanding of. *"They talk about many things like in PE that we don't know. Like, they talk of a ring in netball,"* (Q-open Student 15). The use of methods of teaching such as demonstrations, field excursions, and learning by doing are known to provide the students with VI with concrete experiences that make learning real and meaningful (Fast, 2018). It is possible for students with VI to talk about many things in the environment of which they have limited understanding. The use of concrete

experiences allows the students with VI to compensate for what their sighted peers can learn using sight.

Recognition of the Role of Technology in Education of Students with VI

The analyzed data in the study indicated that the participants have recognized the role of technology in the education of students with VI in the tertiary institutions. The findings of the study indicated that applying ICT with assistive devices; use of recorded audio materials and applying the low vision devices made it possible for students with VI to access curriculum materials in the tertiary institutions.

Use of ICT with Assistive Technology to Educate Students with VI

The use of information communication technology has revolutionized the education of students with VI in recent years in a way that has not been witnessed in previous years.

The participants expressed different views on the use of ICT with assistive technology. For instance, students with VI recognized the role of ICT in advancing their education. They said the use of ICT with assistive technologies has enabled them access information easily. The student participants had observed that:

"Lecturers would send materials in print to individual student's cellphone and the student would be able to access it if the phone has a screen reader. The phone can open the document and convert the written document into speech for the student to grasp," (SSI Student 01).

"I am able to get a lot of information from computers with screen readers to write my assignments," (FGI Student 06).

The above sentiment by the student was a clear indication that the use of ICT resources had boosted the students' access to information. One of the limitations brought on a person by VI is the ability to manipulate and access the environment. Therefore, the use of ICT devices fitted with screen readers such as Job Access with Windows (JAWS) and Non-Visual Desktop Speech Access (NVDA) will assist the students with VI to access printed materials allowing them do their assignments like their sighted peers. A student with VI had however expressed concern that ICT devices could only benefit students with skills and knowledge of using the ICT resources. The student observed that:

"Sadly, many students with visual impairments are not able to benefit from ICT because most of the students in the school are not conversant with technology. It is advantageous to some students and to others it was a bit off," (SSI Student 06).

The students advocated for the inclusion of the ICT component in the teachers' training programs. The training in ICT will place the teachers in a better position to use such technology to effectively learn new skills and knowledge. Similarly, lecturers observed that students with VI were using ICT especially their smart cellphones to access information for learning purposes. A participant lecturer stated that:

"I think many visually impaired students use smart phones to access information. For example, I teach curriculum studies in the class of DECTE. I have three learners who are visually impaired. I noted that they have installed apps that are able to read for them the documents," (SSI Lecturer 05).

According to the lecturer, the use of ICT resources had enhanced the ability of the students with VI to learn by allowing them to access the learning materials. Despite the role of ICT in assisting the students with VI to access information, lecturers were concerned that inadequate knowledge and skills on ICT by the students would prohibit them from using ICT resources effectively in a learning context. A lecturer observed that:
"Some students lack skills to handle the assistive technology," (Q-open Lecturer 01).
Accordingly, the lecturers suggested that the students with VI be trained to use ICT resources:

"The in-coming students need to be taken through a training on assistive technologies, especially operating refreshable Braille note taker displays, so as to have them use the devices in the learning process," (SSI Lecturer 02).

The use of ICT resources to produce refreshable Braille was supported by lecturers in the institution. According to the lecturers, refreshable Braille would do away with the employment of Braille transcribers whose role is to translate print into Braille and vice versa. Also, students with VI would no longer require Braille papers on which to transcribe their work. As a result, the cost of including students with VI in the tertiary institutions would be reduced. The use of ICT to educate students with disabilities is an area that has attracted several scholars in recent years (Klingenberg, Holkesvik & Augestad, 2019).

Utilization of Assistive Devices in Learning

There are different equipment currently used in the tertiary institutions. These range from the simple gadgets to the complicated and sophisticated electronic equipment. The assistive devices used in the tertiary institution in which the study reported here was conducted include the Braille machine, slate and stylus, thermoforming machines, scanners and photocopiers. The participant in the study remarked that:

"There are Braille machines, slate and stylus, and Thermoforming machines though the Braille Machines are not adequate," (Q-open Support 01).

The Braille writing equipment such as Braille machines and stylus and slate are widely used in the educational institutions. Slate and stylus are manual equipment used to write Braille. They are laborious, time consuming and tedious to use. On the other hand, Braille machines are faster and efficient mechanical machines used to write Braille (Sight savers, 2018). Although they are faster and efficient in Braille production, they have the disadvantage of being expensive and difficult to maintain. Also, Braille machines make a lot of noise when in operation that causes a lot of discomfort to students without VI in the classrooms/lecture halls. Consequently, students with VI using Braille machines may occasionally be placed in a separate room during examinations; and to allow students without VI to concentrate in their examination.

The Usage of Recorded Audio Materials in Learning

The use of recorded audio materials is a strategy used by institutions to accommodate students with VI. The strategy has the advantage of allowing students with VI to listen to recorded lectures during their free time; and to grasp what they did not fully understand during the lecture. The participant students with VI said that they had recorded audio materials that a student could borrow and listen to at their free time. The following Excerpts indicate the perspectives of the participants:

"The tape recorders were not given to individual students. They are put by the staff in the resource room and if a student needs them, they go to the staffroom, or the resource room and get one," (SSI Student 04).

"I did not have notes on content of Christian Religious Education (CRE), but I was able to pass my mid-term examination by borrowing and listening to the recorded cassettes," (SSI Student 03).

Recorded audio materials play a significant role in the learning of students with VI. Studies have shown that in the absence of sight, a person would mainly rely on the use of auditory sense to receive information from the environment (Agesa, 2014; Fast, 2018). Thus, the use of recorded audio materials can assist students with VI gain much information from the environment. However, the use of auditory channel of learning has limitations. For instance, what students hear in a lecture cannot be revised later unlike what has been written down in form of notes. Recording the lecture using diskettes and cassettes can allow the students with VI revise the subject later at their free time without having to strain to read by touch.

Application of Low Vision Devices in Learning

There are varieties of low vision devices that can be used by students with low vision. The devices have the capacity to magnify images of objects being viewed. As a result, students with low vision can use them to read print, view board as well as look at distant objects. The student participant noted that:

"The institution has some handheld lenses, stand magnifiers, binoculars, and a few telescopes in the resource room," (SSI Student 07).

The sentiment of the participant emphasizes the essential role played by low vision devices in aiding students with low vision to read and write. The devices have played a significant role in the education of students with low vision (Maindi, 2018; Klingenberg, Holkesvik & Augestad, 2019). According to Maindi (2018), low vision devices are devices that lenses to magnify image of objects for students with VI; and hence enable students with VI to access curriculum materials.

Limitation of Resources Available for Students with VI

The presence of students with VI in the tertiary institutions necessitates establishment physical resources and facilities that meet the needs of the students and hence take care of their welfare. The study found that tertiary institution had overstretched physical facilities, inadequate skilled personnel serving students with VI and limited resources for funding the education of students with VI.

Overstretched physical facilities for students with VI

The hostels used by students with VI were congested and there was possibility of losing one's property. This must have frustrated some of the students. A participant student said that:

"Our hostels are really congested. A cubicle can be used by five or six people and that makes it very possible to lose some of your personal items. I was a bit lucky I did not lose my items, but several people lost their personal items like phones and bags," (SSI Student 05).

The above statements by the students depict persons who are frustrated by the congestion in their dormitories. The students felt that in congested rooms, one could easily lose their items. Also, the students felt that congestion in the dormitories could pose a threat to all students especially students with VI who cannot see around. Although, the tertiary institution had overstretched physical facilities, there seems to be some good level of environmental modification that has been done in the institution to accommodate students with VI. The excerpt from the infrastructural observation checklist depicts what the tertiary institution has done.

"The institution has wide pavements made of Cabros blocks with a good kerb to facilitate the

movements of students with Visual impairments. The pavements absorb rainwater and hence do not hold pools of water. The pavement is hard and provides good tactile clue to visually impaired students," (Researcher's infrastructural observation).

The statement by the participant student and the records derived from the researcher's infrastructural observation checklist acknowledge that the social environment of the institution is conducive for students with VI. However, physical facilities such as bathrooms, washrooms and classrooms as well as the lecture halls requires renovation.

Having Few Specialized Human Resources Serving Students with VI

Tertiary institutions including the students with VI in their programs require skilled and professionally qualified staff to serve the students with VI. The participants had different experiences regarding varied specialized human resource personnel available in the tertiary institution. A participant made the following remarks:

"The Braille transcriber prepares Braille reading materials and diagrams and maps for students who are visually impaired," (FGI Student 05).

The student's comment demonstrated the unique roles of the Braille transcriber in the preparation of Braille reading materials and tactile diagrams for students with VI in the institution. Also, students had different experiences interacting with specialist human resource serving them. For instance, a student with VI had observed that:

"I could not do map reading as part of my examination because it had not been adapted by the Braille transcriber. She was sick, so somebody else was assigned to describe for me. I simply found it very difficult," (SSI Student 01).

The student expressed frustration for not being able to access the exam in a format favourable to her. The examination had not been adapted by the transcriber. Eventually, the student could not complete her examination within the stipulated time. The sentiments emphasize vital role played by the Braille transcribers in the education of students with VI. They transcribe print into Braille and vice versa. Participant students with VI observed that:

"For a whole term, we did not study Braille music notation because the lecturer who was teaching it had retired, they were still looking for one from the Teachers Service Commission," (SSI Student 08).

"I did know how to access learning materials through Google, but the computer technician instructed us on how to use Google drive to get information," (SSI Student 07).

The specialist lecturers teach specialized curriculum courses such as Braille music notation, information communication technology (ICT) and orientation and mobility skills. Accordingly, they assist the students with VI access curriculum materials in a manner that cannot be accorded by regular lecturers who are not trained in the unique pedagogical skills.

The sentiments by the lecturer and administrator reveal the presence of specialized human resource in the tertiary institution and their role in the preparation of the curriculum materials for the students with VI. The participants said that:

"We have specialist services given by lecturers trained in education of students with VI and Braillists," (Q-open Adm 01).

The study found that amongst the professionals that served the students with VI in the institution included specialist teachers, Braille transcribers and ICT technicians. Specialist teachers have varied roles that include carrying out visual functional assessment of the students. This entails ascertaining whether the student uses Braille or print; and communicating the same to the authority to ensure that the student is served with the appropriate medium of learning (Otyola, Kibanja & Mugagga, 2017). Also, the specialist teachers assess the learning needs of the student to determine the intensity of lighting required in the classrooms, halls of residence and lecture halls. In addition, the specialist teacher conducts functional skills assessment of students with VI such as the ability to use appropriate ICT devices.

Limited Financial Resources by Students with VI

Students with VI have varied financial needs which should be met in the tertiary institutions. The researcher interviewed the participants regarding the financial resources available for students with VI in the tertiary institution. They made the following remarks:

"The Visually impaired students are faced with a lot of financial problems. It seems that most of them come from poor social economic backgrounds," (Q-open Lecturer 05).

The remarks by the student and the lecturer concurred that most students with VI came from low social economic backgrounds with limited financial ability. The student further made an appeal to the institution to collaborate with other organizations to find ways of providing financial support to students with VI. Students with VI require finances to procure different goods and services. They use the money to procure specialist

equipment such as Braille machines, Braille note takers and Orbit readers. This equipment should be owned by an individual student with VI who should continue to use them to write or access information even after they have completed their studies and are out of the learning institutions. Also, they may occasionally require the assistance of a reader to help them identify and read the content of some textbooks in the library. Therefore, they may require finances to pay for such services.

In addition, students with VI are not exempted from paying tuition fees and other levies in tertiary institutions. Hence, they are expected to meet their financial obligations to the institutions of learning (Zelelew, 2018). This becomes a serious and crucial factor considering that majority of the students with disabilities including those with VI come from low social-economic backgrounds. Thus, providing them with financial support will go a long way in helping them pay their fees and hence complete their studies.

Support by Peers, Lecturers and Technical Staff

The support provided by the peers and lecturers to students with VI was one of the themes that emerged from the analyzed data. The theme has been discussed in terms of support provided to students with VI by peers without VI; and support by the lecturers and other technical staff.

Support by Students without VI

Having students with VI work together with their sighted peers one of the practices that have been embraced by inclusive institutions. The study attempted to find out the relationship that exist between the students with VI and students without VI. A participant student with VI said that:

"We used to go to the library to get books. We sit together with our friends who used to help us. Then we read bit by bit and take the relevant information for every literature we get. But I wish the VIs could access the information from the internet without seeking for help. It could be better. So, ICT knowledge is important for persons with visual impairments," (SSI Student 02).

The comments by the students with VI indicated that there was support provided to them by the sighted students to access curriculum materials written in print. The use of print made curriculum materials inaccessible to students with VI especially those who were totally blind. Therefore, the students with VI required support from their colleagues without VI who read for them textbooks written in print. The support was crucial for the students with VI to complete their assignments. The participant said that:

"Aaa (sic) assistance... I think they just walk the students with visual impairments to places. If they are kind, they will read for you notes, the ones that you do not have. They are really handy. They are helpful because at times you want to go to a place you are not conversant with or you need some guidance, they will walk you to the place," (SSI Student 01).

The sentiment by the student with VI denoted appreciation for the support given to her by the sighted student. The support such as reading for students with VI was crucial for them to complete the given assignment. The students with VI would have had a lot of difficulties moving from one place to another especially in an unfamiliar environment without support given by their sighted peers. Several studies have shown that when students without VI are paired with their counterpart with VI, there are benefits that accrue to all them (Hornby,2015; Oranga, Chege & Mugo, 2020). Moreover, when students with varied abilities work together, it helps in building a cohesive society where persons with different abilities are valued and celebrated.

Support by Lecturers and Technical Staff

Lecturers in the tertiary institution have supported the students with VI in various ways. For instance, lecturers always included students with VI in the students' outing programs. Participant lecturer made the following remark:

"Last week, I took 40 students who belong to the Wildlife Club to tour and climb Mt. Longonot. You know it is our policy to include all students in every activity of the institution. I had three students who are visually impaired in the group going out to tour. We try as much as possible to put the students who are challenged in the list of those going out," (SSI Lecturer 06).

The sentiments by the lecturer indicate concerted effort to include all students including those with VI in all the activities of the institution. This kind of support should be encouraged in all the institutions if students with disabilities are to be fully included.

Policies that Support Inclusion of Students with VI in Tertiary Institutions

The study also sought out to find if the tertiary institution had relevant policies that support inclusion of students with disabilities especially those with VI. The study found that there is need for tertiary institutions to enact institutional policies related to training students with VI.

Institutional Policy on Training of Students with VI

On whether the tertiary institution had policies that guided the inclusion of students with VI. A participant lecturer observed that:

"The institution had a policy on inclusion of students with VI in the training programs. The policy had set clear criteria for admission of students with VI in the teachers' training colleges in the old system of education. According to the policy, students with VI were admitted in the colleges with a grade lower than other students attained in the Kenya Certificate of Secondary Education (KCSE)," (SSI Lecturer 05).

The presence of a policy of admission for students with VI was part of the government's affirmative action to ensure equity in the provision of educational services in the country. The policy accorded many students with VI an opportunity to train in teachers' training colleges and other tertiary institutions across the country. However, students with VI had some challenges following the newly introduced Competency Based Curriculum. The participant administrator had observed that:

"The CBC system of education requires the students to study all the subjects during their teacher training. However, there are subjects which pose a lot of challenges to the students with VI. Our students with VI have difficulties studying Mathematics, Art and Craft, and Science," (SSI Adm 01).

The administrator cited Art and Craft, and Mathematics as some of the subjects which pose a challenge to students with VI. The students also said they experience challenges while tackling Mathematics. The former system of education that had put the subjects into two groups and allowed the students with VI to select the group of subjects that was favorable to them was more preferred compared to CBC. Also, the study found out that the criteria of admission set by CBC have challenges. A lecturer talked about admission criteria in the CBC system of education and had the following views:

"The strict selection criteria into diploma and degree programs have locked out many students with VI in training programs," (Q-open Lecturer 06).

There is an urgent need for the Ministry of Education to revisit the admission criteria in the teachers' training colleges to ensure equity in education. The tertiary institution had set some policies on the assessment of students with VI. For instance, students with VI were given extra 30 minutes during examinations. The participant made the following remarks:

"During the examination, students with visual impairments were separated. Yes, inclusion was there but since there was complaint that the noise made by Braille machine was disrupting our colleagues, we agreed to sit our examination in a separate room. I cannot say that it was exclusion. They had set a room where we would take our exams from," (SSI Student 02).

The institution's policy to give the students with VI an extra 30 minutes to take their examination on top of the set time for the sighted students means that the institution recognizes that the mode of learning for students with VI is different and therefore disadvantages them. The students with VI need more time to accomplish the same tasks taken by sighted students. Also, students with VI were put in a separate room during examination to shield the sighted peers from the noise made by the Braille machines during the examinations.

Institutional Policies on Social Relationship with Students with VI

The institution had policies on how the students with VI related with the sighted peers. For instance, students with VI were not expected to queue when being served meals. A student participant made the following remarks concerning institutional policy:

"The only thing they were keen about is just giving the blind students the opportunity not to queue during meals and giving them a room during exams. But when it came to notes, if you do not have full support before the exams, when it comes to exams, it will be upon you to work hard and pass," (SSI Student 01).

Kenya has adopted the inclusive education policy in her quest to include students with disabilities in the mainstream of the society. The policies on inclusive education are contained in various documents that include but not limited to education commission reports, sessional papers, and education committee reports (Chikati, Wachira & Mwinzi, 2019). The policies will not translate into appropriate inclusive education practices unless they are fully understood and embraced by the individual institutions involved in the inclusion of students with disabilities.

Strategies of Improving Inclusion of Students with VI

The study found that there were different strategies that could be used to improve the inclusion of students with VI in the tertiary institutions. These included induction of lecturers on the use of appropriate methods of teaching; procurement of more assistive devices; employment of more specialist human resources; expansion of the existing physical resources, and modification of the physical environment used by students with VI.

IV. Conclusion And Implication Of The Study

The study provides a detailed description on inclusion of students with VI in a tertiary institution in Kenya. It also highlights the challenges inherent in the process of including students with VI and provides views by lecturers and students with VI on how to overcome the challenges. Furthermore, the study provides insights by the lecturers and students on strategies that can be used to improve the inclusion of the students with VI in tertiary institutions. The study adds to the body of knowledge base on the inclusion of students with disabilities especially those with VI in the tertiary institutions by exploring the role of policy on inclusion; strategies of making curriculum accessible to students with VI, environmental modifications required to increase accessibility and participation of students with VI and pedagogical support needed in inclusive settings.

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