

Challenges Experienced by Visual Impaired Learners in Physical and Practical Geography

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Abstract – Visual impairment is a state of one partially or fully unable to see. It is a condition where one's eyesight may be affected at birth or after an illness. According to NISE (2001) Modules visual impairment can be classified into two co-groups those who have some sight (low vision) and those who do not have sight completely (blind). Blindness ranges from being totally without sight to unreliable vision and primary reliance on other senses. Low vision is a reduced central acuity of 20/70 or less in the better eye after correction. (Susan et al., 2003) This state may be caused by cataract, AMD, Corneal opacity, diabetic retinopathy and vitamin A deficiency. Persons with visual impairment experience a lot of challenges especially in learning practical courses or courses that have a lot of illustrations and interpretation. It is against this background that this paper was prepared, developed and presented. The paper examined the causes of visual impairment and further looks at the challenges experienced by a visual impaired person in studying physical geography. Geography traditionally is the study of the earth as a home of humanities which is subdivided into physical and human geography. Physical and practical geography investigates landform formation and changes, photographs and map work interpretation among other which uses a lot of illustrations and require visualization. The paper, therefore, through well thought out ideas, recommends ways for integrating visual impaired persons and their instructors in learning physical geography and other practical courses at ease.

Keywords: visual, impairment, integration, physical

1. INTRODUCTION

Education is the backbone to every individual in Kenya regardless of the physical, mental and psychological challenge. Through these therefore the government integrated education system where all learners are to participate equally in the learning processes whether physically challenged or not. Under inclusive education, the system was adjusted to meet the learner's needs; the learner goes to any learning institution in his/her community. All members of the

institution should be responsible for supporting all the learners especially those with special needs who have equal opportunity to participate in school activities.

Impairment is any loss or abnormality in an anatomical structure or a physiological or psychological function. Visual impairment refers to a functional limitation the eye(s) or visual system due to a disorder or disease that can result in a visual disability or a visual handicap (WHO,1992). Most of these visually impaired persons have different abilities and needs and are more talented in one way or another in that some have very good language skills and their touching sense is very sensitive. However, they experience a challenge in learning practical courses and in this case the physical geography.

Geography is a complex course that involves the use of varies techniques both qualitative and quantitative especially in carrying out inquiries. It also includes skills like drawing, analyzing, computing, and interpretation among others. The concepts in physical geography are based on landform formation and changes, soils and minerals, lakes and rivers, climate and the atmosphere, plant and animal distribution, ocean and coastal processes which are blended with practical techniques that includes Geographical Information Systems (GIS) and cartographical techniques which require visualization hence needs a lot of observation skills.

This paper sets out to examine the challenges of visually impaired person in learning. Specifically, the paper discusses the challenges experienced by visual impaired persons in learning physical and practical geography, the causes of impairment and recommend on possible solution in handling students of these state.

1.1 The Concept of Visual Impairment and Causes

Visual impairment refers to a significant functional loss of vision that cannot be corrected by medical, surgical operation or ordinary optical lenses such as spectacles. It includes both low vision and blindness as clinically defined by the World Health Organization (WHO, 1992).

Low vision is the inability to see a distance of 6 meter (20 feet's) even with the use of lenses while blindness is the total loss of the eyesight. Traditionally, visual impairment was considered a curse and it was believed to be caused by bad omen. Children who were visually impaired were neglected and some society could even kill them. UNISE (2002) notes that visually impaired children face many challenges, they are in most cases neglected by parent, not given priority to study and lack instructional materials. At school, they are isolated and taken as shovel out cash in the society. Visual impairment has several causes and specifically, it is more common in aged people than children. More than 82% of all blind persons are 50years of age or older (Resnikoff et al., 2004).

Visual impairment in children is more critical and more concern is put on it due to fear of the life span spent in blindness (Warren, 1994). It is caused by: Rubella infection during pregnancy, congenital eye diseases like congenital cataract, problems during delivery like retinal

problems of prematurity and acquired eye diseases like cornea infections and tumor of the eyeball among others. However, this situation can be detected at early stages through such symptoms like: lack of eye contact, the child do not blinking to bright light, do not look at his/her hands, he/she do not visually follow moving objects, there is slow respond to voiceless toys or parents meaning they only respond to sound, there is no imitation of other, they do not reach out for things and mostly they fear gross motor activities.

Further, visual impairment is caused by: Cataract. A cataract is an opacity or cloudiness of the lens of the eyes, sometimes present at birth. Students with cataracts have reduced visual acuity and hazy vision that makes near and distant visual activities difficult, particularly in bright light. They may have poor colour discrimination. It is the most common cause of world blindness (Resnikoff, 2004). Cataract risk factors includes: cigarette smoking, Uv-light exposure, diabetes mellitus, malnutrition, heavy alcohol use, Trauma or medication use.

Visual impairment is caused by: glaucoma. It is the 2rd most common cause of world blindness. Glaucoma is a disease in which there is damage to the optic nerve, through increased pressure from the fluid within the eye, resulting in reduced visual acuity and loss of peripheral vision. The fluid pressure is monitored regularly by an ophthalmologist. Students with glaucoma generally have difficulty with mobility and focusing their gaze between near and distant objects (Congdon, 2003).

Age-related macular degeneration is another cause of blindness. It is a chronic, degenerative condition commonly in older individuals that affects the part of the eye responsible for central vision. Macular degeneration is an eye disease which results in gradual loss of central vision. Students with macular degeneration have difficulty reading print on the blackboard or page(West, 2000). AMD is of two types: dry and wet which involves proliferation of blood vessels which cause blindness. The risk factors of AMD are increasing age, cigarette smoking, and family history, low dietary intake of zinc, white ethnicity and hypertension.

Garg et al. (2005) established corneal opacity which is caused by corneal disease or trauma with subsequent scarring and possibly monocular or bilateral blindness.

Diabetic retinopathy an important public health problem affecting millions of people worldwide is a major cause of blindness. It is a specific micro vascular complication of diabetes, persons with type 1 diabetes and some with type 2 diabetes have retinopathy after 20years.(Klein et al., 1998).

Rose R.C. (2010) posited in his study that vitamin A supplements are inexpensive and may decrease cases of low eyesight. It is necessary for retinal function and ocular epithelial cell development. Vitamin A deficiency can cause dry eye, with a spectrum of severity ranging from night blindness to corneal ulceration.

Visual impairment is cause by Trachoma which is common in developing countries. Trachoma is caused by serotypes A-c of the bacterium *Chlamydia trachomatis*. It is spread

through contact with eye discharge carried by flies. It causes scaring of conjunctiva and eyelid deformities which in turn can lead to blindness (Bailey & Lietman, 2001)

Onchocerciasis is a parasitic disease spread by black fly which breeds near fast flowing rivers and it commonly known as river blindness. It is common in developing countries and especially in Africa (WHO, 1995).

2. DISCUSSIONS

2.1 Challenges of Visually Impaired Persons

Inclusive education system is the best practice for all. It reduces discrimination, visual impaired persons can share information which they have limited access to, and they are assisted by others for smooth integration. However, it has some challenges that come with it hindering smooth learning for visually impaired person. Students with visual impairments sometimes have fewer natural learning experiences of their environment because they are not able to observe objects and interact with them. The areas of learning which are particularly affected are: concept development; interpersonal communication skills; life skills; orientation and mobility skills; and academic development.

According Lidya (2014), a blind child will hear the sound of an animal but his listening capacity will not give him any idea of the shape of that animal or the characteristic of it. It becomes very challenging for a blind learner to perceive qualities of physical objects without being provided with materials in forms of models or embossed diagrams for touch and manipulation in which kinesthetic sensation participate.

Horton (1998) said that some objects are very large that they cannot be observed tactually. Mountains, rivers, escarpment, ocean, plateaus, plains, large buildings for example cannot be observed tactually. More so, some concept like the study of the solar system, which include the moon, star and heavenly bodies, concept of hydrological cycle for example gives a challenge to lecturer teaching a visually impaired persons. This therefore indicates that a lot of experiences which are taken for granted by seeing learners are either impossible or much more difficult for blind learners. Sighted learners are privileged to access most of classroom activities like drawing of features, measuring weather elements, measuring distance, interpreting maps and photographs among others, while in the case of blind learner, tactual perceptions only give partial meaning of objects.

In physical geography for example, most concept requires fieldwork or field research to put an emphasis on the study areas. Learners are expected to move around their environment and study the actions of various processes and resultant features. River action, wind action, weathering, mass wasting, the study of rock to mention but a few calls for the field study which posses a lot of challenge to a visually impaired persons.

Visual impaired students especially the blind experience a challenge of mobility. Most high learning institutions have widespread structure or lecture room. This became a challenge for blind learners to master the room easily and until they get some help from sighted student they tend to miss most classes. The implications of the restricted ability to get about by oneself are a twofold handicap (<http://www/education/2010>). Mobility limits the blind person in his movement and lacks opportunities to observe and explore the surrounding and therefore has no opportunity to use the geographical eye.

While sighted children have the opportunity to move about and discover their surrounding with ease, the blind child who cannot do this with any comparable ease needs to be supplied with experiences and opportunities for activities which most other children meet in the ordinary course of their development and in their learning environment. The blind child has much less chance to explore his surrounding, and even if he does now and then, his experience does not give him any comparable amount of knowledge. Besides the factual experience that he may be able to secure, he perceives many cues as just indicators but not reality (Olmstead, 2005).

Mobility, is the capacity or facility of movement it has two components. One is mental orientation and the other is physical locomotion, According to Ndurumo (1993) mental orientation has been defined as the ability of an individual to recognize his surroundings and their temporal or spatial relations to himself, and locomotion as the movement of an organism from place to place by means of its organic mechanism. Both are essential for mobility but are not separate functions.

Further, visual impaired persons do not get the factual information of their environment. Studies in physical geography require a lot the use of observation skills. Best (1998) asserts that a blind child understands very little of what a wave is, how it forms, moves, breaks-just by reading the word or even listening to the sound of the wave; a common object like chimney will not be really understood unless the object is directly experienced through touch. In teaching learners with visual impairments, all the senses must be integrated. The haptic sense, the factual sense, olfactory sense must be integrated to the lost sense of sight.

In physical, practical geography and other science related course most learners without visual impairment problems spend time perusing through papers looking at different drawings and diagrams, visiting GIS lab carrying out executions in order to understand given concepts yet for learners who are blind or those with visual loss most of the work presented is in writing without supportive models or embossed diagrams making it difficult for the learners to get the concept. Totally blind learners lack the real ideas and only acquire substitutive ideas because they live in the seeing world which makes constant use of experiences. Writing figures in Braille and intense concentration creates a lot of difficulty to the blind learner who uses Braille for reading and writing.

Ndururno (1993) asserts that learners with loss of sight in mainstream schools experience a number of difficulties. One, this learners find themselves in a strange world where they seem to be strangers among their sighted peers who in most cases are the majority and lack awareness on

visual impairment. In most cases, the blind learners are largely obliged to learn by listening and occasionally by touch. Sometimes, they are ignored by their overburdened teachers who under teach them making imaginations take some trick. In most cases especially at high learning institution, most lecturers in lecture hall stop this student to take the notes in class due to noise cause by the typing Braille and the learners remain ideal as others are taking their notes

According to Barraga (1993), learners with visual loss are also faced with a problem of reading suitable textbooks and writing in Braille which their media of reading and writing. These makes the curriculum look overcrowded. Subjects that involve a lot of movement for example games and physical education present special problems to individual learners, who have difficulty in free movement. A shy learner who is blind easily misses a great deal of incidental benefits that come from ordinary school life. Most special teachers available are few in regular school and already overburdened with the regular curriculum hence concentrating on learners with visual loss becomes a problem. In the classroom situation these makes learners with visual loss lag behind in academics (Scholl, 1986).

Students with visual impairments may need a variety of specialized materials and equipment in order to function effectively in the school environment. In most regular learning institution these becomes a challenge and the resources available are for the majority ignoring most students with disabilities. Teaching of map work for example a lot of topographical extract are there but Raised line maps or atlases for blind student may not be availed. Gilford and Graham (1992) also confirm that apart from lacking independence and sometimes motivation especially when overprotected by parents and caregivers' learning is also hindered by classroom management, lighting, seating arrangement, printing materials, writing, materials, class safety, teaching and learning aids as well as additional curriculum area such as Braille, independent living skills, orientation and mobility and socialization among others where essential.

2.2 Towards Integrating Visually Impaired Persons into Physical Geography

Physical refers to a body. Development of concepts is the basis of all learning. Spatial relationships, time, body awareness and self-awareness are just a few examples of fundamental concepts individuals need to make sense of their world. These concepts may need to be specifically taught to students with visual impairments (Susan et al., 2003). Although the main focus will be on academic development, providing a variety of opportunities for personal development can have a profound impact on a student who is visually impaired. Encouraging a positive self-image, appropriate dress, well-developed self-care skills, good interpersonal communication, appropriate behaviors, increased independence and productive community living can all be tremendously beneficial in the healthy growth of students with visual impairments. As with all students, relationships are important for students with visual impairments and the classroom can be a wonderful place for development and maturity to flourish.

Physical geography also known as geosystems or physiography is one of the two major sub-fields of geography. It deals with the study of processes and patterns in the natural environment like the atmosphere, hydrosphere, biosphere and geosphere. These concepts, therefore, call for a lot of interaction with the environment through use of skills like observation, photograph taking, sampling, drawing, measuring to mention but a few. Putting into consideration that the course is not designed for student without visual problems, integration is necessary to cater for all. The student with blindness will participate in the regular program and hence adaptations are needed.

In giving of instruction or teaching, the instructor should always talk as he illustrates concepts in physical and practical geography. (Connie et al., 2003) said that students with blindness miss visual cues and written instructions. Consider talking through classroom activities, for example, describing non-verbal messages and responses, introducing lessons, transitions, closures to all activities, announcing assignments and naming speakers. Provide advance notice to the student and the teacher assistant of materials required for the next class so that everyone is prepared. Real-life examples and tangible materials can assist in establishing relationships between abstract learning and the student's experience. Consider the use of "hands-on" material where possible, to provide opportunities for kinesthetic and tactile learning.

In discussing processes and the resultant features, vulcanicity, folding, faulting for example use raised line diagrams and avoids too many details to avoid complexity. Other teaching materials can be the use of raised line maps or atlases which can be made from string, pipe cleaners, wool, foil, clay, sand, plaster, and sandpaper. Maps should be simple and small enough to be encompassed by both hands. Tactile maps should give a limited amount of information and more details are needed, a series of maps can be used, with additional data on each map.

Visually impaired persons should be provided with modern technology instrument that will ease their learning process especially the geographical information system (GIS). They should be provide with electronic Braillewriters which is small electronic devices that have standard Braille keyboards that allow the user to write, read, edit and sort approximately 200 pages of Braille. They can be connected to personal computers as well as regular and Braille printers. Electronic Braille writers have speakers for voice output; have an adjustable rate of speech; are portable; can run on a rechargeable battery; can be used to silently take notes in the classroom; and have either a small Braille display and/or speech output. Others technologies includes: scanner, Braille printers, language masters, recorder among other. Thought affordability and availability of such technology might be a challenge especially in the developing countries, donors, government and other well-wishers should be involved to assist in acquiring these equipment.

In case of a field study, the visually impaired persons should not be ignored. All the preparation should be done considering them and priorities given to them in that if the study includes some tangible resources, they should be availed to enable tactual observation. Likewise,

in case the study is complex, the instructors should take time in explaining the concepts so that the V.I student internalize and conceptualize the ideas of the study.

According to Susan (2003), it is important to hold regular meetings with the support team, particularly those who will be working directly with the student. This provides the opportunity to discuss daily, weekly or long-range program plans, become familiar with the topics and vocabulary which will be taught, and discuss necessary adaptations. The development and implementation of the student's program is coordinated by the resource and classroom teacher. Since the geography teachers might not be specializes in teaching V.I students, they need to work closely with a specialist who may assist them convert the class notes into brail notes to be availed to the students early enough or at the beginning of the classes.

For the safety of the visually impaired persons, it is important to include the student within the full spectrum of school life, including executions, field trips, work experience and social events. A student with blindness faces extra challenges when getting used to the physical environment of the institution. Everything from attending GIS labs and visiting the washroom can present possible difficulties. The following suggestions will help ensure the student's safety. Firstly, familiarize the student with the school building as soon as possible, keep lecture room, corridors and stairs free of clutter, Ensure that the student is aware of any object or piece of furniture that has been moved, close or fully open doors and cupboards, ensure that teachers and students are familiar with the sighted guide technique among others.

The instructional process must include opportunities for the student to explore new objects and places and be exposed to a variety of experiences. Students must experience a variety of textures, shapes, weights, temperatures, sounds, smells and tastes to build meaningful relationships and concepts about the environment through the following

- Provide opportunities to practice and reinforce skills in natural settings throughout the day.
- Repetition is necessary for the student to master new skills.
- Talk while you teach. Students miss visual cues and information from the environment.
- Use real life material as much as possible. This provides opportunities for kinesthetic and tactile learning.
- Activities should be task analyzed and broken down into steps so that each step can be taught sequentially.
- Provide opportunities for the student to be with students who do not have visual disabilities for the purposes of modeling their behavior.

3. CONCLUSIONS

Education is for all. Those who are physically challenged require acquiring it equally as the rest. The paper demonstrated that it is of great importance to integrate visually impaired

persons in the normal classroom environment by creating inclusive culture which is concerned with creating an environment in the schools, where everyone feels welcomed and valued. It is an environment where staff members, lecturer/instructors collaborate with each other, as well as learners helping one another. The government should also play a big role in supporting the institutions with V.I persons by providing necessary equipment and training specialists

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