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Full Length Research Paper

Evaluation of reading proficiency of learners with low vision while using low vision devices

John Ayieko Yalo[1], Francis Chisikwa Indoshi[2]

[1]Department of Special Needs Education, Maseno University, Private bag, Maseno, Kenya.
[2]Department of Educational Communication, Technology and Curriculum Studies, Maseno University, Private Bag, Maseno, Kenya.

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Reading is a basic human need. Low vision training programme was initiated in Kenya in 1994. Learners with low vision were to be trained to function as literate individuals in spite of the limitations brought about by low vision. The purpose of the study was to evaluate the reading proficiency of low vision learners.The study was carried out in six schools for the visually impaired in Kenya. The respondents included seventy eight learners with low vision. Survey research design was used to collect data. Research instruments used were questionnaire, observation schedule and a reading proficiency test. Findings from the research were that learners with low vision faced monumental challenges when reading. Among the challenges they faced were following straight lines while reading with low vision devices, miscall of words and word attack skill problems. The study calls for curriculum adaptation to suit the reading needs of learners with low vision.

Keywords: Low vision, visual skills, visual efficiency, low vision devices.

INTRODUCTION

According to the world Health Organization (WHO), a low vision person is one who has a visual impairment even after treatment and or standard refractive correction, and has a visual acuity of less than 6/18 to light perception or a visual field of less than 10 degrees from the point of fixation but who uses or is potentially able to use vision for the planning and or execution of a task(Corn and Koenig,1996).

Individuals with low vision have defective vision that require support for learning and environmental adaptation in order to optimally use vision for acquiring environmental and educational concepts.

Faye and Clare (1975) observed that low vision involves diagnosis of any eye disease, referral for surgical or any other medical correction, refraction correction and followed by advice on optical and non optical aids for enhancing the use of the residual vision, instruction in the use of the prescribed aids and psychological counseling and training the individuals to maximally use the low vision aids. Primarily, the concept of low vision involve the use of residual vision for learning purposes instead of the out- dated belief that use of defective vision can cause it to deteriorate further. Barraga (2006) and Corn and Koenig (1996) have both confirmed through experiments with learners with low vision that use of low vision improves visual functioning.

There are two major categories of low vision devices; optical and non-optical. Optical devices have lens systems that tend to improve on the retinal spread of tasks viewed visually (Corn and Koenig 1996). Non optical devices are non-lens adaptations that involve enlarging/minifying and/or adapting the visual environment through the use of colour contrast and adequate lighting in order to improve on visual functioning (Jose, 1985). Optical and non-optical devices may be used in combination in order to have the desired visual clarity and functioning.

Barraga (2006) observed that learners with low vision need to be helped to develop behaviours and skills that will enable them to participate with peers in age appropriate skills from the earliest time of play and recreational activities. Reading is both academic and recreational for learners with low vision. Therefore, there is need for evaluation of the reading proficiency of such

*Corresponding author E-mail: findoshi@yahoo.com

learners as a basis for developing strategies to enhance their reading skills so that they can compete with the sighted in recreational, academic and vocational skills (Beard, 1987).

Pumfrey and Reason (1992) add that skills in phonemic analysis help children to learn to read, and training in sound categorization can improve reading progress.

In Kenya, English being a third language, learners have difficulties reading in this language. This is because they do not have opportunities to support reading because letter sounds and word recognition are not in the learners' language .Therefore, the skills of reading must be synthesized from their elements (Republic of Kenya, 1988). As Pumfrey and Reason (1992) observed, most children learn to recognize printed words by attending first to higher order knowledge about language and life in general. Thus, the learner with low vision in Kenya is seriously disadvantaged due to the fact that reading is introduced in a language that the learner does not think in nor form concept in. Therefore, from the onset of reading, learners with low vision may experience challenges in reading proficiency that need intervention strategies. This was the focus of this study.

Research Questions

The study was based on the following research questions:

i) What is the reading proficiency of learners with low vision?

ii) What are the challenges experienced by learners with low vision during reading activities?

Methodology

Design

The study employed survey method in gathering data. Cohen and Manion (1992) noted that survey gather data at a particular point in time with the intention of identifying standards against which existing conditions can be compared. Fraenkel and Wallen (2000), Borg and Gall, (1989) note that descriptive survey involves asking the same set of questions from a questionnaire from a large number of individuals either by mail, or by telephone. The researcher used management oriented evaluation model specifically applying the Content, Input, Process and Product (C.I.P.P.) evaluation as propounded by stufflebeam (2000). The purpose of C.I.P.P. evaluation is to interpret and have value judgment of challenges that learners experience when reading with low vision devices. Stufflebeam (2000) notes that the proponent of management oriented evaluation view evaluation as the process of delineating and providing useful information for judging decision alternatives. The study was carried out in two phases. The first phase was a pilot study in which the research instruments were tried out on learners of grades seven and eight in one of the schools for the visually impaired pupils in Kenya. The pilot phase was carried out to clear any ambiguity from the research instruments.The pilot phase also validated the vocabulary and phrases included in the reading proficiency test. The second phase was the actual study that involved each individual learner reading given texts, while errors made and/or words read accurately were recorded and noted down as areas of difficulty or success.

Participants

Participants in this research were learners with low vision in grades seven and eight from six primary schools for the visually impaired in Kenya. Schools for the Visually Impaired in Kenya admit both totally blind and learners with low vision. They learn alongside each other. They share text books that may either be in Braille or print. The current research excluded learners who were totally blind. Saturated sampling was used to select 78 learners from the six schools as follows:

A=14 B=13 C=12 D=9 E=17 F=13

The six primary schools for the visually handicapped were distributed in five provinces of Kenya as follows:

1) Kibos School –Nyanza province
2) St Oda School-Nyanza province
3) St. Francis School, Kapenguria-Rift valley province
4) Likoni School-Coast province
5) Thika School-Central province
6) Kilimani Integrated Programme-Nairobi province

Instruments

The research instruments used during the study consisted of an observation schedule, a questionnaire and reading proficiency test .The observation schedule was arranged in three distinct sections. The first section solicited information about availability of optical low vision devices. It determined whether or not the devices adequately met learners' learning needs.

The second section solicited information about the availability of non optical low vision devices. It also solicited information about environmental modification for learners with low vision. The third section solicited information on the actual learners' use of low vision devices.

The questionnaire was structured to have two main sections. The first section was aimed at soliciting background information about the school, the number of learners on roll, number of learners with low vision

Table 1. Reading error analysis

Word	How it was read
Salty	Sali
Papyrus	Papis
Varieties	Varie
Tuber	tabo
Shallow	Shalo
Swamps	Swompes
Agricultural Land	Cultural Land
Tuber crops	Timber Crops
Aquatic	equantic
Varieties	Variety
Depression	depreset
Baringo	Bongo
Fresh	Fish

actually taught through the visual modality, and availability of low vision devices that were in use during curriculum discourse. The second section of the questionnaire was aimed at obtaining information about the expertise of teachers trained to work with learners with low vision.

Data Analysis

Frequency counts from the observation schedule were converted into percentages that were later used to compare the reading proficiency of learners with low vision. The percentages were also used to evaluate observed miscall and word attack problems among learners with low vision. The percentages were also used to make a value judgment about the reading proficiency. The information gathered from the questionnaire was triangulated with that gathered from observation schedule. Themes about reading challenges, environmental modification and availability of low vision devices were organized so that value judgment was made from the themes and sub-themes that were observed.

RESULTS AND DISCUSSION

Reading proficiency of learners with low vision

Learners were given two texts to read aloud in two minutes. Table1 shows the common mistakes made by the learners.

Learners had difficulties of miscalling of words and wrong pronunciations due to first language dominance. Learners from class eight of one of the participating schools had good reading proficiency. Their fixation and scanning skills without low vision devices were impressive. In that particular class, five students read the passages well and the slowest read each of the two passages in a time of two minutes proficiently. However the group made some mistakes of miscalling of words. The class had difficulties pronouncing words from the passage on swamps. It has to be noted that the class had good word attack, scanning and tracking skills. Otherwise the class had good reading proficiency skills and could easily pass for a class of normally sighted learners. Other schools that participated in the research had each one dominant mother tongue that seemed to have influenced learners pronunciation and miscalling of English words. English being a third language after mother tongue and Kiswahili, the mistakes made while reading were related to association problems.

Good visual functioning requires regular practice at performing visual tasks. This is in line with Barraga (1983, 2006) and Luek et al (2003) who observed that learners with low vision need to be helped to develop behaviours and skills that will enable them to participate with peers in age appropriate skills from the earliest time. Learners with low vision need a support base for low vision use. They may need to regularly interact with peers who experience similar visual problems so that they can support one another emotionally. The learners need many and varied visual experiences to be able to improve on their visual motility skills. Had majority of learners developed basic scanning and fixation skills the rampant errors that were cited earlier could not have persisted to upper primary classes. It is also critical to note that lack of encouragement to use low vision devices, and limited support from the teachers and significant others from learners learning environments precluded low vision functioning among learners with low vision ((George and Duquette, 2006; Gompel et al, 2004).

Barraga (2006) observed that teachers should expect responses to visual tasks to be slow, and that learners with low vision should be encouraged to look and look more in order to develop faster visual functions. The investigator observed that only learners with head borne low vision devices were the ones who functioned with the low vision devices. When most learners were asked why they were not using low vision devices they said that the devices were either broken or lost and therefore they had to perform their curriculum tasks unaided. Learners need to use devices during the habilitation phase but may do without the devices for visual functioning later on. However it was also possible that lost or broken devices that had not been replaced forced the learners to learn to read without them.

Reading is critical to full participation in modern society , and as learners with low vision advance on the academic ladder , the concern for print accessibility in order to discover new knowledge through independent study become a reality. Rusell-Minda (2007) and Blankenship and Nancy (2008) reported that research on legibility of typefaces and psychophysical variables suggested that certain characteristics can affect legibility and reading acuity for both sighted readers and those

Table 2. Challenges experienced during curriculum interaction

Challenges	Frequency	Percent
Difficulties of writing on straight lines	64	82.05
Tire quickly due to close working distance	50	64.10
Crowded diagrams in course books	49	62.82
Can not cover curriculum content in time allocated	49	62.82
Lack of writing and reading stands	36	46.15
Scanning with low vision devices	36	46.15
Lack of controlled lighting within classrooms	34	43.58
Poorly built classroom	32	41.02

with low vision. Legibility of typefaces includes reading speed and critical print size. The critical print size is the smallest print size at which individuals can read with their maximum reading speed.

The purpose of this study was to evaluate the reading proficiency of learners with low vision using selected texts from upper primary curriculum. The fact that those learners in Kenya begin reading in a foreign language that they do not have command of make their reading proficiency lag behind. Corn and Koenig (1996) observed that reading is a birth right and survival skill that all learners must acquire in the USA. The Kenya government recognizes acquisition of reading skill as an approach to eradicating illiteracy, poverty, and ignorance among her citizenry. Literacy skills can be used to support and guide the activities that are required in order to function independently in society as well as for enjoyment and personal gratification. The Kenyan society places high stakes on the attainment of literacy, for example, for one to be employed gainfully in a public office, one must be literate and able to read fairly fast.

Challenges experienced by learners with low vision during reading activities

The learners were asked to indicate challenges they faced while reading using low vision devices. Their responses are shown in Table 2.

A major challenge faced by learners with low vision was completion of curriculum content within the stipulated time frame. For example the primary school cycle is intended to last for eight years. Jose (1985) noted that scanning and fixating with low vision devices tend to take more time of learners with low vision. It was observed that learners with low vision tire quickly due to the effort required to read and/or write with low vision devices. This may make learners to be slower at accomplishing visual tasks. Therefore research findings in this paper tallied with Jose (1985) who argued that learners take longer to accomplish curriculum content. Be it as it may, it remains a point to note that learners with low vision require more time to accomplish curriculum content designed for the primary cycle. To create more time for learners to accomplish the curriculum, schools for the visually impaired should be programmed to start each term two weeks early, and close each term one week later than the regular school programmes. Cumulatively schools for the visually impaired will have nine weeks extra to do curriculum tasks. Lack of prescriptive spectacles was another challenge that learners with low vision experienced. Corn and Koenig (1996) noted that a variety of lenses have been developed for use as optical devices, such as microscopes binoculars and monoculars. It was observed that lack of optical devices restricted learners from functioning visually. Schools for the visually impaired are called upon to make it a policy that learners who need low vision device support must have them in order to improve on their visual functioning.

Corn and Koenig (1996) noted that if learners do not learn to use low vision devices properly they will develop visual fatigue and therefore will dislike the use of devices for performing visual tasks. Another challenge that was indicated was scanning with low vision devices. This was consistent with what Jose (1985) noted that magnifiers must be held at there correct focal points which make users to hold the aids at very close working distances. Such close working distance causes fatigue. The fact that learners with low vision must move the device and at the same time scan with their heads not eyes can slow them down when performing visual task. Writing/reading stands are non-optical devices that were glaringly lacking from all classrooms the researcher visited. Writing/reading stance are non-optical devices that move the visual task within the visual sphere of the individual for the task to be regarded properly; and reduce both muscle and visual fatigue. Corn and Koenig (1996) argued that without reading/writing stands learners with low vision develop poor posture due to close working distance, and that they tire readily thus may not complete visual tasks without getting fatigued. It is observed here that for learners to improve on their comfort, they need equipment such as reading/writing stands that can improve on their ergonomics

Jose (1985) pointed out that training and instruction in the use of prescribed low vision devices is the most

challenging aspect of the low vision services. A successful training programme in low vision use involves professional co-operation, flexibility, and ingenuity (Bachofer, 2007). Jose (1985) and Deremeik et al (2007) further noted that both teachers and learners with low vision must be familiar with all optical parameters, limitations and modifications of low vision devices in order to be able to use them well during curriculum interaction. This observation is pertinent to low vision functioning because if teachers do not understand the functionability of devices they cannot possibly instruct learners with low vision to successfully make use of the low vision devices. On the other hand learners who cannot operate, take care and keep devices safety for use when needed, may not attach importance on the device use as such may refuse to learn to use them or might misplace them because they may be of little value to them. Training on how to make use of devices may make learners to understand how devices augment visual function and use. It was observed during the investigation that each school for the blind in Kenya has two low vision support teachers charged with low vision training in addition to a full teaching load. Such arrangements seemed to over burden the two teachers resulting in failing to adequately attend to low vision training. Partly that accounted for learners failing to make use of low vision devices.

Failure to use device as support to learning was a major challenge to learners with low vision because it denied them access to a broad curriculum, and did not prepare them to be independent learners who can be able to find new information from the learning environment.

Jose (1985), Goldie et al (1986) and Corn and Koenig (1996) noted that learners with low vision who used low vision devices had their self-esteem changed from touch readers to print readers. It would seem that learners with low vision in Kenya are constrained from accessing the curriculum and the learning environment by both low vision and semi-trained personnel inadequately trained to work with learners with low vision. It may be a major challenge for learners with low vision to function with rudimentary low vision devices that may not be task specific, and not tailored to meet idiosyncratic visual behaviors. Challenges to using low vision devices may emanate from the learners who may not know how to keep the Devices focused or may not know how to keep the devices clean. Challenges from the devices may be due to the lenses causing the learner headache, and/or nausea.

Learners with low vision regularly interact with learners who are totally blind; therefore they do not get peer support from fellow learners who are blind. It entails that learners with low vision have very few role models in schools for the visually impaired. Barraga (2006) observed that learners with low vision require to regularly interact with peers who experience similar visual problems so that they can support one another emotionally. The learners require many and varied visual experiences to enable them to improve on their visual motility skills .It would therefore seem that schools for the blind in Kenya may not be the ideal environments from which learners with low vision can function optimally.

Barraga (2006) observed that learners with low vision read slowly, often moving their heads or books instead of the eyes. It becomes more frustrating if learners who have central scotomas (visual cells at the center of the retina that have been destroyed by disease) and have to use eccentric viewing and at the same time make use of a hand held magnifier. Because of the close working distance that may be required, learners with low vision may end up casting shadows on the visual tasks thus reducing visibility. It was observed that learners in such situations experience challenges of using their low vision devices because of poor illumination. Jose (1985) observed that low vision devices tend to make learners adhere to the reading distance determined by the focal distance of the lens.

In effect learners cannot choose their own reading distance but have to read as per the focal distance of each low vision device. It is a fact that the stronger the magnifier the shorter the reading distance (Jose, 1985). Such demand on the learners with low vision may cause fatigue and poor muscle tone. This is a challenge that learners faced and learners in such situations find it difficult to extricate themselves from.

Conclusion

The skills that make the teacher understand the learning and visual needs of learners with low vision are key to successful low vision functioning in educational programmes. Bachofer (2007) noted that low vision functioning entails problem solving and not problem getting. Therefore, to help learners with low vision to improve on their reading proficiency, educators dealing with low vision training must avail learning support to perform reading tasks proficiently. Learners pronounced words badly and some words were miscalled. They should be taught attack skills so that they can read whole words by avoiding the synthetic method where words are read piecemeal phonetically.

Among the challenges learners faced while reading with low vision devices was scanning. It is important that learners be taught how to scan with the head and the device but not the eyes. Eyes must be kept as steady as possible.

School based in service courses should be organized by the ministry of education to equip teachers with skills

of working with learners with low vision. It was noted that most learners did not poses low vision devices for performing near and distance visual tasks. Low vision devices should be bought through the school equipment scheme so that learners can have pertinent and relevant devices that can provide appropriate support for learning.

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Appendix

Read the following two texts loudly in two minutes.

LAKES

A lake is shallow on the earth's surface in which water collects.

Africa has some of the largest lakes in the world such as lake Victoria and Tanganyika. Some of the lakes in Africa have fresh water. This because they have rivers flowing in and out of them. Examples are lakes Victoria, Baringo, Naivasha, Chad, Tanganyika and Kyoga. Other lakes are salty because they have no rivers flowing out of them, for examples lakes Mgadi, Bogoria, Nakuru and Turkana.

(1 Minute)

SWAMPS

Swamps are shallow depression containing water and covered with aquatic (water) vegetation some swamps are seasonal, that is they form during rain season along rivers and near lakes. Others are permanent. Aquatic vegetation is composed of papyrus, reeds and sud. Some varieties of fish and reptiles find swamps suitable places to live in. Swamps can be good agricultural lands if drained for growing rice, sugarcane and tuber crops. They can also be fishing grounds.

(1 Minute)