EDUCATION 5.0

PERSPECTIVES

AND

PREIVIEWS

DR D. THOMAS ALEXANDER

DR S. AMALADOSS XAVIER

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REV. DR. D. THOMAS ALEXANDER SJ.

PRINCIPAL,

ST. XAVIER'S COLLEGE OF EDUCATION (AUTONOMOUS)

PALAYAMKOTTAI, TAMILNADU.

REV. DR. S. AMALADOSS XAVIER SJ.

DIRECTOR, FR. BONHOURE CENTRE FOR RESEARCH

ST. XAVIER'S COLLEGE OF EDUCATION (AUTONOMOUS)

PALAYAMKOTTAI, TAMILNADU.

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ASSISTIVE TECHNOLOGIES IN EDUCATING VISUALLY IMPAIRED CHILDREN

*Dr. L. Vasanthi Medona, Assistant Professor in Mathematics, St. Ignatius College of Education (Autonomous), Palayamkottai.

*E. Aarthi, Assistant Professor in English, St. Xavier's College of Education (Autonomous), Palayamkottai.

Abstract

We often quote senses are the gateways of wisdom and knowledge. When a child is deprived of the visual sight, the child undergoes various issues both physically and mentally. Education is the basic right of each and every human being in this world and these visually impaired students too have their right of education. Visual impairment means weakness or defect in the power of seeing to the extent that it becomes a hurdle in the way of an individual or a child in the act of reading or studying, in carrying out various duties of daily routine. Special care needs to be given with regard to the education of the visually impaired children. Assistive technologies help the visually impaired students in their teaching and learning process. This article presents the meaning and types of visual impairment, the problems faced by the students with visual impairment and the role of assistive technology in the education of the visually impaired students.

Keywords: *Visually Impaired, assistive technology, word processors, abacus, Braille,*

Introduction:

Education is a weapon to change the world. Technological advancements have plunged into the digi-era perhaps it makes education possible even for differently abled children. Though at present opportunities are given for the differently abled kids in normal stream, yet they undergo certain problems. In order to get rid of all the difficulties technological advancement helps these students to reach new horizon in the field of education.

Students with visual impartment were given first priority to receive special education services in U.S. Good has endowed human beings with five senses. Among those seeing and hearing are most important for interacting others. Even when a person cannot talk he/she interacts with others through some actions. Visual impairment is considered as the most severe and traumatic physical handicap. A child is said to have visual impairment if he/she cannot see and require Braille system. Students with visual impairments need an educational system that takes all things into account.

Meaning of Visual Impairment:

The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act (PWD Act), 1995 uses the terminology 'Blindness' and defines it as:

i) Total absence of sight or

ii) Visual Acuity not exceeding 6/60 or 20/200 (Snellen) in the better eye with correcting lenses; or

iii) Limitation of the field of vision subtending an angle of 20 degree or worse.

The blind child is defined as one whose visual loss indicates that he/she should be educated chiefly through the use of Braille and other tactile and auditory materials. The partially seeing child is defined as one who has some remaining useful vision and can use print and other visual materials as part of the educational program.

Types of Visual Impairments:

Blindness ☐ Students with near blindness do not receive any stimuli from their visual channel. They depend entirely on input from other senses. No eyesight is available in both eyes of person with total blindness.

Therefore, totally blind is defined as complete absence of visual perception.

Myopia ☐ Visual impairment arises due to some problems in focusing. Myopia results from the elongation of the eyeball (Medona & Selvakumar, 2016). It is the medical term for the condition known as nearsightedness. As the name implies, people who are nearsighted can easily see objects that are near to them, but struggle with objects that are far away. Myopia affects people from all walks of life and of all ages.

Hyperopia ☐ This type is contrast to myopia. Hyperopia is the medical term for the common eye condition known as farsightedness. Those who deal with hyperopia have difficulty seeing things that are near to them, but have better vision for objects that are far away. Hence the distant objects are very clear but nearer objects are bedim.

Astigmation ☐ Astigmatism is one of the most common eye health problems worldwide. It occurs when the cornea is irregularly shaped because of the curvature of the lens inside the eye. An irregularly shaped cornea prevents light from focusing properly on the retina. As a result, vision becomes clouded.

Colour Blindness ☐ It is a condition where a child finds difficulty in differentiating between certain colours. It is due to some hereditary disorder, but it can also due to damage to the retina.

Low Vision ☐ Low vision is the term used to describe significant visual impairment that can't be corrected fully with glasses, contact lenses, medication or eye surgery. Children with low vision are able to learn using their visual sense, but they are in need of some magnified print type scripts.

Problems Faced by Visually Impaired Children:

The visually impaired children undergo many problems in their daily life. They have some behavioural problems, problems of social adjustment and problems in learning. Some of the problems are given in the following:

Poor Intelligence Level ☐ Senses are the gateways of wisdom. These children have problems in their gateways itself. Even some research reveals that these children have a poor intelligent quotient (IQ) level. They have some problems with exploration of the environment that leads to poor concept formation. So this leads to poor IQ level.

Academic Retardation ☐ Visual impairment is the main factor for poor acquisition of knowledge. These children have poor academic achievements since they use Braille which is tedious to read and write. These children have a slower reading rate and lack of concreteness in instructional procedures.

Slower Speech Development ☐ A natural way of learning a language is through imitating others. But these children learn language through what they hear and from occasional touch observation. Hence the visually impaired child exhibits verbal unreality. Verbal unreality is defined as the visually impaired individual's inappropriate reliance on words and phrases that are not consistent with his/her sensory experiences.

Personality Disorder ☐ Personality development of an individual depends upon hereditary and environmental factors. It is a psycho- physical organisation of the individual modified by his/her life experiences. Visually impaired children undergo nervous strain and a feeling of insecurity and frustration that has an impact on their personality development. Life experiences go in their own ways which are totally different from normal children.

Problems related to Social Adjustments ☐ Visually impaired children are often looked down and ridiculed by others. This leads to a creation of an inferiority complex among these

children. In some cases, these children are portrayed as pitiable beings. That too affects their personality. They face both personal and social adjustment problems.

Assistive Technology for the Visually Impaired:

Assistive technology enables someone with a disability to access information or main stream technology independently. It's sometimes called as "access technology". Assistive technology for visually impaired or partially sighted people includes the following teaching and learning aids. There are different assistive technologies for different aspects.

1. Reading:

Reading is an essential aspect for gathering knowledge irrespective of any particular subjects. Visually impaired students are deprived of reading by themselves. They are slow in reading ability and lack concreteness in instructional processes (Pankajam, 2009). There are various assistive tools to support reading in order to develop their literacy.

Enlarged Text☐ Students who have low vision can be provided with some text information in enlarged format. Enlarged text can be acquired through some publishers or materials, can be modified through the magnification feature of copy machines, while text size of most digital materials can be easily adjusted to a user's preference.

Audio Books☐ Audio books are generally recorded using human voice, and can be accessed through the use of specialized computer software devices or mainstream tools like MP3 players. The use of auditory books can be a wonderful and invaluable tool for students who are blind or visually impaired.

- Book share provides access to books that are legally scanned for people who are visually impaired or print disabled. The books can be read with adaptive technology or in embossed Braille.

- Learning Ally is a national nonprofit provider of books in accessible format for people who cannot read standard print due to visual, perceptual or physical disabilities. Provides thousands of titles available on digitally recorded audio books and computer disk, including textbooks.

Braille Labeler ☐ This device is used to identify their belongings. Through labeling items in the student's environment it will not only reinforce vocabulary, spelling and reading but will also promote independence and assist with orientation.

2. Writing:

Writing is also one of the important literacy skills. In order to develop writing skills among the visually impaired person there are some devices which support them.

Slate and Stylus☐ Slate and Stylus are tools used by visually impaired persons to write text that they can read without assistance. It is a small mechanical device used for writing Braille by hand. It is just as a pencil and paper that are used for writing print. It is the oldest Braille writing method. Slate and stylus devices are available in a variety of shapes and sizes.

Word Processor with Refreshable Braille Display☐ A Braille display device connects to a computer with a special cable. It takes information appearing on the computer screen, translates it and displays it in Braille, a line at a time. A line of refreshable Braille consists of a series of electronically-driven pins that pop up to form Braille characters. As the cursor on the screen moves across a line or down the page, the line of Braille characters changes to reflect what is currently under or near the cursor. This ever-changing line of Braille is called refreshable. The refreshable Braille display provides direct access to information, giving the visually impaired students the ability to check format, spacing and spelling.

Electronic Braille Note Taker☐ It is one of the devices used to take notes in class using a Braille. These notes are transferred to a computer or in print formats. Many note taking devices have word processors, appointment calendars, calculators or clocks and can do

almost everything a computer can do. The note taking devices generally are the size of book and are easily carried and used by the student.

3. Mathematics:

Taylor Arithmetic Frame ☐ The surface of this aluminium frame is divided into star shaped holes with eight angles, thus allowing the double-ended metal types to be placed in different positions according to a set system. This frame is suitable for teaching arithmetic to visually impaired persons.

Arithmetic and Braille Writing Slate ☐ This has a Arithmetic frame on one side and a Writing slate on the other. It also has reversible type clamp and two guide lines supplied with a wooden stylus.

Abacus ☐ A simple instrument for performing rapid arithmetical calculations. It consists of a frame holding thirteen vertically arranged rods on which beads slide up and down. The beam supporting the beads is marked with a raised dot at each rod position and a raised bar between every third rod. The bars serve to indicate the decimal point and other units of decimal measure.

Talking Calculator ☐ Audible calculator in synthesized speech. It is useful for calculation, clock, alarm and calendar.

Opisometer ☐ A bell rings each time the disc moves a distance of one meter. It is useful for the visually impaired students regarding mapping and understanding mathematical problems in length and perimeter.

Conclusion:

The sense of sight plays a vital role in gaining and understanding the concept or idea. Due to lack of sight the students with visual impairment are deprived of learning and communicating hence socializing in manifold ways. Visually impaired children are strengthened through various supportive devices in their every walk of life. The assistive technologies enable the students with visual impairment to excel in their educational arena and to fly with multi colours in their life.

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