Visually Impaired Children

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The human eye is like a camera that collects, focuses, and transmits light through a lens to create an image of its surroundings. In a camera, the image is created on film or an image sensor. In the eye, the image is created on the **retina**, a thin layer of light-sensitive tissue at the back of the eye.
Like a camera, the human eye controls the amount of light that enters the eye. The **iris** (the colored circular part of the eye) controls the amount of light passing through the pupil. It closes up the pupil in bright light and opens it wider in dim light. The **cornea** is the transparent, protective surface of the eye. It helps focus light, as does the **lens**, which sits just behind the iris.
When light enters the eye, the retina changes the light into nerve signals. The retina then sends these signals along the **optic nerve** (a cable of more than 1,000,000 nerve fibers) to the brain. Without a retina or optic nerve, the eye can't communicate with the brain, making vision impossible.

Visual impairment is a term experts use to describe any kind of vision loss, whether it's someone who cannot see at all or someone who has partial vision loss. Some people are completely blind, but many others have what's called **legal blindness**. They haven't lost their sight completely but have lost enough vision that they'd have to stand 20 feet from an object to see it as well as someone with perfect vision could from 200 feet away.

The Individuals with Disabilities Education Act (IDEA) officially defines as "an impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness."

Conditions that may cause vision loss after birth include:

- **Amblyopia** is reduced vision in an eye caused by lack of use of that eye in early childhood. Some conditions cause a child's eyes to send different messages to the brain (for example, one eye might focus better than the other). The brain may then turn off or suppress images from the weaker eye and vision from that eye then stops developing normally. This is also known as a "lazy eye." **Strabismus** (misaligned or crossed eyes) is a common cause of amblyopia, since the brain will start to ignore messages sent by one of the misaligned eyes.
- **Cataracts** are cloudy areas in part or all of the lens of the eye. In people without cataracts, the lens is crystal clear and allows light to pass through and focus on the retina. Cataracts

prevent light from easily passing through the lens, and this causes loss of vision. Cataracts often form slowly and usually affect people in their 60s and 70s, but sometimes babies are born with congenital cataracts. Symptoms include double vision, cloudy or blurry vision, difficulty seeing in poorly lit spaces, and colors that seem faded.

- **Diabetic retinopathy** occurs when the tiny blood vessels in the retina are damaged due to diabetes. People with retinopathy may not have any problems seeing at first. But if the condition gets worse, they can become blind. Teens who have diabetes should be sure to get regular eye exams because there are no early warning signs for this condition. To help prevent retinopathy, people with diabetes should also avoid smoking, keep their blood pressure under control, and keep their blood sugar at an even level.
- **Glaucoma** is an increase in pressure inside the eye. The increased pressure impairs vision by damaging the optic nerve. Glaucoma is mostly seen in older adults, although babies may be born with the condition and children and teens can sometimes develop it as well.
- **Macular degeneration** is a gradual and progressive deterioration of the **macula**, the most sensitive region of the retina. The condition leads to progressive loss of central vision (the ability to see fine details directly in front). Macular degeneration is often age related (it occurs in older people, especially older than 60), but sometimes it can occur in younger people. Excessive exposure to sunlight and smoking can increase the risk for age-related macular degeneration. Symptoms may include increased difficulty reading or watching TV, or distorted vision in which straight lines appear wavy or objects look larger or smaller than normal.
- **Trachoma** occurs when a very contagious microorganism called *Chlamydia trachomatis* causes inflammation in the eye. It's often found in poor rural countries that have overcrowded living conditions and limited access to water and sanitation. Blindness due to trachoma has been virtually eliminated from the USA.

Characteristics of Learner with visual impairment

1. Every student with a visual impairment is **unique**. Visual functioning can change from day to day, hour to hour or minute to minute.

2. Individual learners with visual disabilities may present a **wide range of cognitive and other disabilities** (severe cognitive needs, deaf blindness, gifted and talented, physically challenged, etc.)

3. Each student may need **learning materials** in alternative media that may change over time.

4. Incidental learning (learning without specific instruction) is affected by lack of or limited day-today **visual observation**.

5. Learners may have **difficulty traveling** independently and safely without direct intervention.

6. Learners need to have visual information presented in multisensory modalities.

7. Learners may need alternative **organizational skills** to be directly taught.

8. Learners will have **difficulty in physical environments** that are not consistent and predictable.

9. Many learners **cannot visually receive nonverbal communication** and must be specifically taught how to express thoughts and feelings nonverbally.

10. Learners depend upon **adaptive equipment** and technology to facilitate learning in the general classroom and on the job.

11. Learners require **specialized strategies** in order to acquire independent living skills (cooking, marking appliances, etc.)

Identification of Visually Impaired Children

Appearance of Eyes	• One eye turns in or out at any time • Reddened eyes or lids • Eyes tear excessively • Encrusted eyelids • Frequent styes on lids
Complaints When Using Eyes at Desk	• Headaches in forehead or temples • Burning or itching after reading or desk work • Nausea or dizziness • Print blurs after reading a short time
Eye Movement Abilities (Ocular Motility)	• Head turns as reads across page • Loses place often during reading • Needs finger or marker to keep place • Displays short attention span in reading or copying • Too frequently omits words • Repeatedly omits "small" words • Writes up or down hill on paper • Rereads or skips lines unknowingly

	• Orients drawings poorly on page
Eye Teaming Abilities (Binocularity)	• Complains of seeing double (diplopia) • Repeats letters within words • Omits letters, numbers or phrases • Misaligns digits in number columns • Squints, closes or covers one eye • Tilts head extremely while working at desk • Consistently shows gross postural deviations at all desk activities
Eye-Hand Coordination Abilities	• Must feel things to assist in any interpretation required • Eyes not used to "steer" hand movements (extreme lack of orientation, placement of words or drawings on page) • Writes crookedly, poorly spaced: cannot stay on ruled lines • Misaligns both horizontal and vertical series of numbers • Uses hand or fingers to keep his place on the page • Uses other hand as "spacer" to control spacing and alignment on page • Repeatedly confuses left-right directions
Visual Form Perception (Visual Comparison, Visual Imagery, Visualization)	• Mistakes words with same or similar beginnings • Fails to recognize same word in next sentence • Reverses letters and/or words in writing and copying

	• Confuses likenesses and minor differences • Confuses same word in same sentence • Repeatedly confuses similar beginnings and endings of words • Fails to visualize what is read either silently or orally • Whispers to self for reinforcement while reading silently • Returns to "drawing with fingers" to decide likes and differences
Refractive Status (Nearsightness, Farsightedness, Focus Problems, etc.)	• Comprehension reduces as reading continued; loses interest too quickly • Mispronounces similar words as continues reading • Blinks excessively at desk tasks and/or reading; not elsewhere • Holds book too closely; face too close to desk surface • Avoids all possible near-centered tasks • Complains of discomfort in tasks that demand visual interpretation • Closes or covers one eye when reading or doing desk work • Makes errors in copying from chalkboard to paper on desk • Makes errors in copying from reference book to notebook • Squints to see chalkboard, or requests to move nearer • Rubs eyes during or after short periods of

visual activity

- Fatigues easily; blinks to make chalkboard clear up after desk task

Educational Provisions for Visually Impaired Children/Teaching Approaches

There are a number of teaching approaches that the teacher can adopt, for example, teaching through activities, role play, unit teaching, discovery method, programmed instruction, behavior modification, etc.:

Emphasis on Concrete Experience

Visually impaired children cannot learn by imitation through visual experience alone. They need to do it through their other senses also, such as sense of hearing and sense of touch. Appropriate teaching aids should therefore be used to allow them to touch and learn from concrete experience. What they have learnt will thus be clearer and more accurate.

Use of Verbal Instructions

Instructions and explanations given by the teacher should be clear and concise. The teacher should read out clearly everything written on the blackboard. When speaking to the children, he should first address them by their names to ensure attention. To make sure that the children understand what is taught, he should ask them questions when necessary.

Management of Printed Materials and Diagrams

According to the visual condition of individual children, the teacher should choose appropriate teaching materials to meet their individual learning needs. Printed materials and diagrams may have to be adapted by using contrasting colours, enlarged size, increased boldness, adequate spacing, etc. In producing tactile diagrams for these children, the teacher should note the following:

(a) choose diagrams of appropriate sizes to suit the fingertips of totally blind or severe low vision children;

b) simplify cluttered or superimposed diagrams without compromising accuracy;

(c) emphasize the most important areas, lines and points in tactile diagrams;

(d) avoid cluttering too much information and coding on one page, or this will confuse the children.

Classroom Organization and Management

(a) Attention should be given to classroom organization and management so as to provide optimum learning. The classroom should be big enough to allow the children safe mobility. The children should be provided with large desktops for their bulky textbooks and equipment so that they can have a comfortable work area. Since natural light is the best source of illumination, low vision children will benefit from sitting by the window.

(b) Although better illumination often improves the perception of low vision children, direct sunlight should be avoided. Venetian blinds can be installed to address the problem. In gloomy days or other adverse illumination situations, intensive lights with background lighting of diffused fluorescent lights can be installed in the classroom especially for low vision children who use ink-print books. As far as possible, the surface of furniture or walls should best be in matt finish to avoid unnecessary glare. In order to facilitate the use of intensive lighting, audio and visual equipment, adequate electric power points should be installed safely in appropriate places.

(c) The classroom should be equipped with adequate notice-boards for display of learning materials, timetables, schedules, educational posters, children's work, etc. both in print and in braille. Materials and equipment kept in a particular classroom or special room should be clearly labelled in large print or in braille to give the children easy access. Should the teacher find it necessary to move the furniture in the classroom, all children should be informed beforehand.

Participation in Co-curricular Activities:-

Participation in co-curricular activities for all handicapped children could be a great source of encouragement to develop sense of personal worth and self-confidence.

Orientation and Mobility:-

The movement of such children are much restricted because of their visual handicap. They are not autonomous and independent in moving around. For, this good sense of hearing, smelling and kinesthetic and tactile experiences ought to be developed with the help of techniques.

Provision for Integrated Education: -

The instructional material and teaching techniques from the standpoint of visually handicapped children need a major curriculum adaptation in order to adopt an integrated system of education. The

partially handicapped need different assistive educational material such as books of large print, magnifiers and adjustable furniture etc.

Unified Instruction:-

Right from the primary education the visually handicaps should be given chances to move about independently like that of normal children. They should be provided daily life experiences such as to buy something from the grocery shop and from some other store to visit post office and bank etc.

Vocational Training and Placement:-

Vocational training appropriate for the visually impaired children and their placement is of paramount importance according to needs of present day Indian society.

Residential Schools:- Residential schools are loosing its importance in modern scenario. Government provides full support and owns financial liabilities of those organizations which make necessary curricular adaptations, changes in teaching and learning techniques and provides needed supportive and assistive devices and learning materials to the disabled children.

Mainstream Schooling:-

It is best possible system of education for all including the handicapped children. This pattern of education is considered to be most beneficial for all having education with all others sharing and learning together under one roof.

Safety Precautions in Conducting Outdoor Activities, Sports and Games

The teacher should take special safety precautions when conducting outdoor activities, sports and games. The activities should be conducted in spacious ground. Places with fixtures, objects or wall-blocks that can be of danger to the children should be avoided. Anything lying disused on the floor should be cleared so that the children will not fall over them. Children with albinism should not be asked to stand for too long uncovered under strong sunlight. They can wear tinted glasses to reduce the discomfort caused by the glaring sun. Children who require spectacles should wear plastic glasses.

Specific Teaching Strategies for Totally Blind and Severe Low Vision Children

(1) **Medium of Literacy**

As visually impaired children are not able to use print as a means of communication, braille has to be used instead. Before the children are ready for braille reading, training in the development of tactile sensitivity of the hand is important. Training in long and short term memory to retain the impression of configuration of symbols is helpful to the development of reading readiness. English and Chinese braille should be taught as early as the children are ready to learn them. A good braille reader usually moves his fingers lightly along the braille line without regression. High level of concentration and comprehension is required in speed reading. The teacher should discourage reading by scrubbing movement, lip movement and sub - vocalization. Braille writing is usually introduced with the Brailler. Writing with a hand frame should be introduced later when the children need to write short notes.

Developing Skills in Other Modalities

Tactile Skills: Direct contact by means of touch is the only way in which totally blind and severe low vision children can learn about form and texture. Thus the way in which the hands are used for exploration is significant. The teacher should understand the importance of tactile perception in the children's development. Guided tactile manipulation and exploration with supportive language can help the children to establish concepts such as rough, smooth, hard, soft, etc. Encouragement should be given to increase the range of investigations by using different tactile strategies such as scanning with a flat hand, manipulation with fingers and the thumb, etc. Visually impaired children need to have maximum opportunities for first-hand exploration of objects.

Auditory Skills: For children with defective vision it is important to be able to listen critically and with concentration to auditory information. The teacher may offer programmes that encourage the children to pay attention to auditory materials and provide tape-recorded materials instead of, or in addition to, printed or braille texts. The teacher can devise listening activities to reinforce what has been learnt.

Use of Special Aids and Equipment

For the education of visually impaired children, it is necessary to use a variety of teaching aids and equipment to help them to learn. What aids and equipment to use will depend on the children's visual functioning and educational levels. Owing to rapid development in

technology, the list of adaptive aids and equipment shown below is not exhaustive. However, they can be categorized into visual, tactile, auditory and computer aids and equipment.

Visual Aids and Equipment

(1) **Closed circuit television** : used to enlarge images on a television screen with variable sizes, contrasts and illumination.

(2) **Lighting** : using lamps to provide the amount and angle of light required for maximum reading efficiency.

(3) **Textbooks and instructional materials** : learning materials to be presented in large print.

(4) **Book-stand or raised desk-top** : to bring printed materials closer to the children's eyes for better lighting and easy reading.

(5) **Optical aids** : spectacles, contact lens, telescopes and magnifiers, which are important low vision aids and should best be prescribed by qualified professionals.

Tactile Aids and Equipment

(1) **Braille books** : books transcribed into braille.

(2) **Optacon** : an electronic reading device which transforms ink-print characters in books with an electronic lens into vibrating shapes that can be read tactilely with a single finger.

(3) **Paperless braille writer** : a braille writing and reading device which can store braille written information on audio cassette tapes, floppy disks or computer chips and can be retrieved later to be read on a braille display or in synthetic speech output, e.g. VersaBraille, Eureka/ Braillemate, etc.

(4) **Slates and stylus** : writing slates made either in a plastic or metal frame with openings through which braille dots are punched with a pointed stylus.

(5) **Thermoform duplicators** : duplicating machines for mass-producing plastic braille pages and raised pictures for braille users.

Auditory Aids and Equipment

(1) Print access reading systems for totally blind and severe low vision children : OSCAR using computer scanning technology to convert print into synthetic speech output.

(2) Audio tapes and recorders : useful for taking notes, recording homework, listening to assignments, etc.
(3) Talking calculators, clocks, electronic dictionaries, etc. : aids available with synthetic speech output.

Computer Applications

Microcomputers, operated with appropriate special software and computer adaptive devices, make it possible for visually impaired children to have equal access to electronic data like their sighted peers. Besides learning the computer as a subject in special schools, visually impaired children can use the computer to assist them in learning other academic subjects and as an aid to communication with sighted children.

CLASSROOM PRACTICES FOR STUDENTS

To provide effective classroom practices for students who are visually impaired, educators need to:

1. Provide adapted tools, texts, and materials.

2. Provide disability awareness for peers with sight.

3. Provide materials in appropriate media.

4. Provide environmental modifications. • lighting • positioning • increasing/decreasing visual information

1. Encourage use of a variety of literacy options.

2. Adapt assignments and tests as needed.

3. Provide opportunities for pre-teaching skills.

4. Provide opportunities for direct instruction and practice of nonverbal communication skills.

5. Provide opportunities for students with visual disabilities to discuss the impact of their disabilities with other people with visual disabilities.

6. Provide opportunities to role-play social situations.

7. Provide audio descriptions of visual presentations.

8. Provide community referenced instruction. 9. Provide adaptations and opportunities to practice life management skills.

10. Provide opportunities to learn organizational systems for home, school and work.

11. Provide direct instruction in travel skills in the home, school and community.

12. Provide instruction in and opportunities for proactive self-advocacy skills.

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