Resource Guide for Teachers of Children with Visual Impairment

TEACHER EMPOWERMENT FOR DISABILITY INCLUSION

Resource Guide for Teachers of Children with Visual Impairment

December 2020

cbm
together we can do more

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Co-funded by the European Union

Contents

Introduction

At least 2.2 billion people globally are estimated to have a visual impairment or blindness.[1] In the 2001 South African Census 724 169 people self-reported having a visual impairment.[2] Visual impairment is recognised as a major barrier to access education and employment for people in South Africa.[3] (Naidoo, et al., 2015).

This resource guide has been created as a supplement to TEDI's Teaching Learners with Visual Impairment (low vision and blindness) course. This course is intended for teachers at special, full service or ordinary schools who have, or may in the future have, learners with visual impairment in their classes. It can also be used by parents, principals, district officials and members of district-based support teams.

Links to various topics that are relevant to teachers, support staff and parents in supporting learners with visual impairment are included.

Facts and statistics about visual impairment can be found here:

The World Report on Vision
https://www.iapb.org/resources/the-world-report-on-vision/

Blindness and vision impairment
https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment

[1] WHO (World Health Organization). 2019. 'Blindness and vision impairment'. Available at: https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment [accessed 10 June 2020].
[2] StatsSA (Statistics South Africa). 2005. *Prevalence of Disability in South Africa Census 2001.* Report No. 03-02-44. Pretoria: StatsSA.
[3] Naidoo, K.S., Jaggernath, J., Ramson, P., Chinanayi, F., Zhuwau, T. and Øverland, L. 2015. 'The prevalence of self-reported vision difficulty in economically disadvantaged regions of South Africa', *African Journal of Disability*, 4:1, Article 136.

Visual impairment organisations and service providers in South Africa

There are several South African organisations dedicated to assisting people with visual impairment. They offer training in disability-specific skills, which can help people with visual impairment to reach their full potential and be fully included in society. These organisations also aim to eliminate society's reduced expectations of people with visual impairment, and monitor the extent to which civic society and government are fulfilling their roles and obligations towards them. The list below includes providers of braille books and assistive technology, and organisations that focus on disability in general.

Organisations and colleges that support people with visual impairment

Blind SA
https://blindsa.org.za/

South African National Council for the Blind
https://sancb.org.za/

South African Guide-Dogs Association for the Blind
https://guidedog.org.za/

South African Braille Authority
https://sabrailleauthority.org.za/

South African Library for the Blind
https://www.salb.org.za/

The League of Friends of the Blind
https://lofob.org.za/

Innovation for the Blind
https://www.facebook.com/innovationfortheblind

Cape Town Society for the Blind
https://capetownsocietyfortheblind.co.za/

KwaZulu-Natal Society for the Blind
https://www.kznblind.org.za/

Nkosinathi Foundation
https://www.nkosinathifoundation.org/

Helen Keller Society
https://helenkeller.org.za/HK1/

St Dunstan's
https://www.stdunstans.org.za/

Hein Wagner Academy
https://www.heinwagneracademy.org/

Orientation, mobility and technology support

Orientation and Mobility Association of South Africa
https://www.omasa.org.za/

South African Mobility for the Blind Trust
https://sambt.org.za/home/

Editmicro
https://editmicro.co.za/

Sensory Solutions
https://sensorysolutions.co.za/

Optometrists

South African Optometric Association
https://saoa.co.za/

Disability in general

South African Disability Alliance
https://www.sada.org.za/

Myths about blindness

People with visual impairment often talk and write about the typical misconceptions around being blind or having low vision. On pages 27 and 28, we have included some links to blogs created by people with visual impairment. These are some examples of the common myths or false assumptions that are encountered:

Myth ***Blind people see only darkness, nothing else***

Reality According to the World Health Organization (WHO) (2019), about 253 million people live with visual impairment. Of those, 36 million are blind, but the WHO does not specify how many have no light perception (NLP). The world isn't always completely dark for people who are blind and the majority do have some functional vision. Some eye diseases impact central vision, while others affect peripheral vision. Many people who are blind can still distinguish shadows, see forms or shapes, have cloudy vision, or differentiate between light and dark. Some people describe a grey or brown haze, while others are able to perceive bright lights or changes in lighting. Different causes of blindness affect people differently.

Myth ***Legal blindness is when a person can't see after taking off corrective lenses***

Reality Legal blindness is a specific measurement required for an affected individual to receive government benefits. Legal blindness does not define or describe functional vision. When a person is legally blind, their functional vision affects their daily living and cannot be corrected by lenses, medicine, or surgery. There are legally blind people who, for personal reasons, do not use mobility aids or self-identify as blind. This is their right and requires no explanation.

Myth ***Blind people have special gifts – a 'sixth sense'***

Reality Blindness doesn't change how your senses of hearing, taste or touch biologically work. However, most blind people learn to use their senses differently to interpret the world around them (e.g. telling which way cars are travelling by listening, or reading braille with their fingertips). The method of learning to do familiar tasks with alternative senses requires repetition, hard work, and a sharp memory. Some research has shown that, in the case of people who have been blind from an early age, the brain can 'rewire' itself to process sensory input differently. It is not a 'superpower' or 'magic'.

Myth ***Most blind people are proficient in braille and own a guide dog***

Reality Only a small percentage of people who are blind have learned braille. Many are discouraged by the opinion of some professionals that it is slow and hard to learn. Most people who are blind don't have a guide dog, either because they do not need one or they have developed other strategies for getting around. Using a white cane is more common. Never assume that a person is not blind just because they don't use a cane or have a guide dog.

Myth ***People who are blind can identify you by your voice, even if they don't know you that well***

Reality This may be true for people they are or were in contact with daily, such as family members or teachers, but overall most voices sound similar. When approaching or beginning a conversation with a person who is blind, it is best to identify yourself first. 'Guess who?' is not a fun way to make contact with people who are blind.

Myth ***People who are blind can't work or remain a job***

Reality People who are blind can succeed in almost any career with the right technology and accommodations. The only barrier is often an employer's willingness to give a blind applicant or employee a fair chance.

Myth ***People who are blind cannot access print or handwritten materials***

Reality Computers and technology have made nearly any kind of print accessible to people who are blind. Computer software can translate print into speech, magnify screen images, and enlarge text to a readable size. Occasionally human readers take care of the rest.

Myth ***People who are blind can't use most technology***

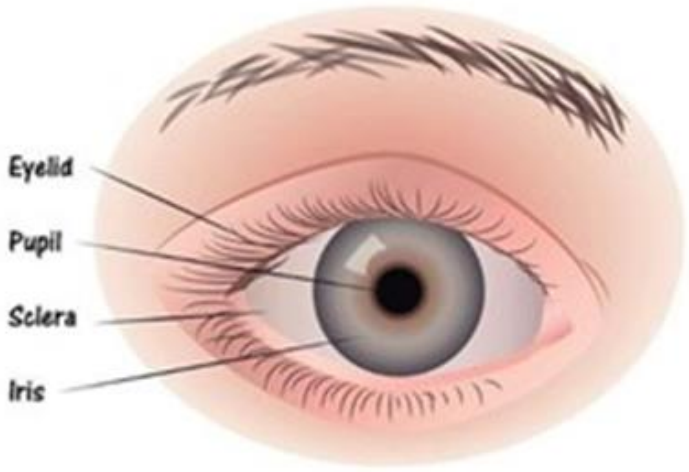
Reality People who are blind use computers, mobile phones, apps and other technology to enhance their independence and make the world more accessible. Many people who are blind say technology has revolutionised their lives.

The eyes

Eye structure

The eye is made up of visible and internal parts.

Visible parts of the eye



Source: Optimax Eye Surgery. https://www.optimax.co.uk/blog/structure-human-eye/

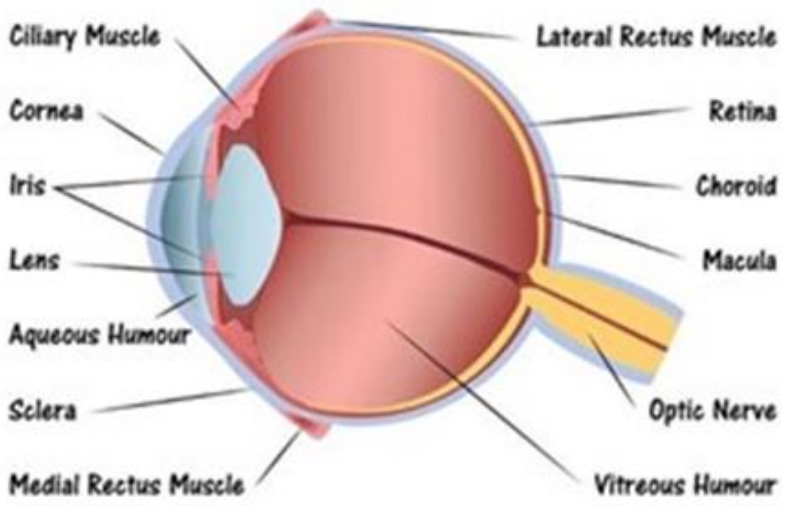
Eyelids: The eyelids cover the eyes to protect them from dust and sweat that could cause damage. They open and close voluntarily and involuntarily. Blinking helps to keep the eyes hydrated and lubricated.

Pupil: The pupil is the part of the eye we see through and changes size according to the level of brightness. In a bright environment, the pupil contracts to let less light in. In a darker setting, it expands to let more light in. This helps us to see well in different light levels and ensures the right amount of light reaches the retina at the back of the eye.

Sclera: The sclera is the white protective outer layer of the eye. It covers the optic nerve and can be a good indicator of eye health. For example, a red sclera might suggest that the eyes and dry or tired, while a yellowish sclera could indicate liver issues.

Iris: The iris is the coloured part of the eye and regulates how much light gets into the eye by controlling the size of the pupil. The iris is made from connective tissue and muscle surrounding the pupil. Its colour, structure and pattern is as unique as a fingerprint.

Internal parts of the eye



Source: Optimax Eye Surgery. https://www.optimax.co.uk/blog/structure-human-eye/

Cornea: The cornea is the clear surface at the front of the eye that lets light in. It covers the iris and pupil, providing a layer of protection. Any imperfections in the curve of the cornea can result in the need for glasses. The smoother the surface of the cornea, the better your vision will be.

Lens: The lens is situated behind the iris and responsible for focus. It can change shape to adjust focal distance, focusing the light rays that pass through it on the retina. With age, protein can build up in the eye and make the lens cloudy (known as a cataract). It can be surgically replaced with a clear artificial lens to restore good vision.

Aqueous humour: This is a watery fluid that is constantly produced by the eyes to maintain good eye pressure and nourish the cornea. It drains from the eye at the same rate it is produced. When this rate is not constant, it leads to glaucoma.

Ciliary muscle: This part of the eye holds the lens in the correct position and regulates the flow of the aqueous humour within the eye. It also changes the shape of the lens, allowing it to focus on different distances.

Medial rectus muscle: There are six muscles that control eye movement (medial rectus, lateral rectus, superior oblique, superior rectus, inferior rectus, and the inferior oblique). The medical rectus is the largest. It moves the pupil towards the midline (towards the nose) and makes sure the eye is aligned correctly. Problems with the medial rectus can lead to strabismus, where the eyes do not align with each other when looking at an object.

Lateral rectus muscle: This muscle is responsible for sideways movement of the eye. Problems with the lateral rectus muscle may result in esotropia. This is a type of strabismus where the eye turns inwards because the muscle is either too weak or not working properly to move it away from the midline.

Retina: The retina is a layer of tissue at the back of the eye. Its main purpose is to receive light from the lens and send signals to the brain to process it into an image. The retina contains two types of photoreceptor cells known as rods and cones. Rods pick up on movement, darkness and brightness, while cones detect colour. Problems with the retina can lead to a loss of vision.

Choroid: This is a major blood vessel that sits at the back of the eye between the retina and the sclera. It nourishes the outer layers of the retina and maintains eye temperature. It also provides oxygen and blood flow to the retina, helping the eye to function well.

Macula: The macula is the central part of the retina. A healthy macula enables clear vision and the ability to see fine details. When the macula is diseased (e.g. macular degeneration), this affects central vision, which can have a huge impact on daily life. It can continue deteriorating until all vision is lost.

Optic nerve: The optic nerve transfers visual signals from the retina to the brain for processing into images. It contains over a million nerve fibres and is part of the central nervous system. Glaucoma is one of the most common ways in which the optic nerve can become damaged. Eye pressure builds up, compressing the optic nerve, meaning visual signals can no longer be transmitted effectively.

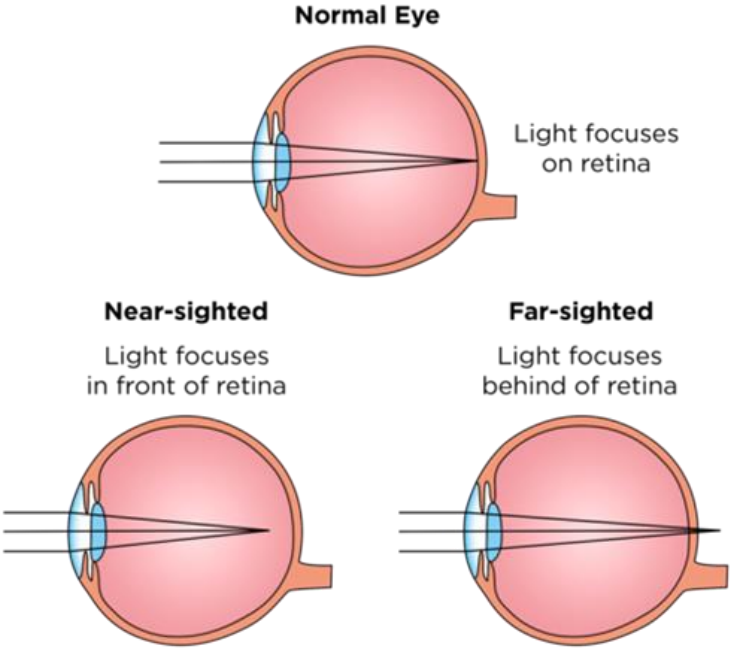
Vitreous humour: This is a gel-like liquid that sits between lens and the retina. If any substances enter the vitreous humour, they are called floaters. They may be small flecks of blood or clusters of cells and, while they can be annoying, they are typically harmless. With age, the vitreous thins and can separate from the retina, causing posterior vitreous detachment. This causes even more floaters but is not sight-threatening.

How do we see?

When light falls on the retina (the back of the eye), photoreceptors turn the light into electrical signals. These signals travel from the retina, through the optic nerve, to the brain. The brain turns the signals into the images we see.

Normal vision consists of clear central vision and full peripheral (side) vision. For that to happen, light must focus exactly on the retina and all the structures in the eye must be healthy.

If the light does not fall exactly on the retina a person is called **far (long) sighted** or **near (short) sighted**. This can be corrected by wearing glasses or contact lenses.



Where light focuses in the eye determines whether we have normal vision, or are near- or far-sighted.

Low vision is when there is significant loss of central vision (visual acuity) or peripheral vision (field), or both, that cannot be fully corrected with glasses, contact lenses, medication, or surgery. This loss of vision can be due to injury or disease.

Low vision requires significant adjustments to daily life. However, there are specialised low-vision aids that can help maximise your remaining vision and increase independence and quality of life.

Central vision is used for reading, writing, recognising people and things, watching TV, driving, etc. – in other words, for all tasks where we need to see detail. Central vision comes from a very small area on the central retina called the macula. If this area is damaged, it can cause central vision to become blurred and dull. Eventually it may lead to dark patches (blind spots) in the central vision.

These pictures show the deterioration that can occur with central vision loss.
Source: Eye Promise. https://www.eyepromise.com/

Peripheral vision is our side vision. Although we are focused on what is in the centre, we have a whole field of vision around this. People are often less aware of the importance of peripheral vision. It is not something that we actively use, but it plays a significant role in gathering spatial information. It helps us to orientate ourselves and is critically important when moving around.

These pictures show clear peripheral vision on the left and evidence of deterioration on the right.
Source: WebMD https://www.webmd.com/ (top) and Wikimedia Commons: Sanet Steyn (bottom)

Eye conditions that can cause vision loss

There are many causes and conditions that can result in visual issues such as poor acuity, field loss, ocular-motor problems, colour vision loss, and processing disorders. It is important to know and understand the different eye conditions associated with vision loss. The conditions described in the table below affect either central vision or peripheral vision.

Eye condition	Description
Albinism	The underdevelopment of the central retina, together with nystagmus (involuntary eye movements), can cause poor vision. Reduced colouring of the iris and retina causes increased sensitivity to light.
Macular degeneration	Age-related macular degeneration (AMD) is the most well-known macular degenerative disease. There are two types of AMD: dry (85–90% of cases) and wet (10–15%). Stargardt disease is a form of macular degeneration found in young people, which is caused by a recessive gene. In all of these instances, the macula, which is responsible for clear detailed central vision, starts to deteriorate.
Cataract	A cataract is clouding of the lens. Cataracts usually develop later in life and are treatable. If a young child has cataracts, the retina is deprived of light stimuli and the eye can become amblyopic (lazy) if the cataract is not removed.
Glaucoma	This is a common eye condition that damages the optic nerve. This is often caused by abnormally high pressure in the eye. Glaucoma affects peripheral vision and, if left untreated, can end up as tunnel vision.
Diabetic retinopathy	This is caused by damage to the blood vessels in the retina. Poorly controlled blood sugar is a risk factor. Early symptoms include floaters, blurriness, dark areas of vision, and difficulty perceiving colours. Blindness can occur. Mild cases may be treated through diabetes management. Advanced cases may require laser treatment or surgery.
Retinitis pigmentosa (RP)	Retinitis pigmentosa is an inherited retinal disease that causes progressive loss of night and peripheral vision.
Retinopathy of prematurity (ROP)	This is a potentially blinding disease caused by the abnormal development of retinal blood vessels in premature infants.
Retinal detachment	The retina pulls away from a layer of blood vessels that provide necessary oxygen and nourishment, often after an injury. It can also result from aging and high myopia. Symptoms include the appearance of bits of debris (floaters), experiencing sudden flashes of light, or a shadow in the vision field. Prompt medical treatment can often save vision in the eye.

People with visual impairment should not be treated in a way that suggests they are their medical diagnosis. The focus should not be on the impairment only. A holistic approach does not focus only on medical terms and interventions, but also human rights, an appreciation of diversity, and inclusion.

Additional resources

Texas School for the Blind and Visually Impaired (USA)
https://www.tsbvi.edu/selected-resource-topics

VisionAware Glossary of Eye Conditions (USA)
https://visionaware.org/your-eye-condition/guide-to-eye-conditions/

The following websites contain vision simulators that enable you to see the impact of common eye conditions.

VisionAware Vision Simulation Video (USA)
https://visionaware.org/your-eye-condition/eye-health/vision-simulation-video/

Ohio Lions Eye Research Foundation Visual Simulations (USA)
https://www.ohiolionseyeresearch.com/research/simulations/

The Fred Hollows Foundation: What does being blind or visually impaired look like? (Australia)
https://www.hollows.org/sightsimulator/

University of Cambridge Inclusive Design Toolkit (UK)
https://www.inclusivedesigntoolkit.com/simsoftware/simsoftware.html

Inclusive education

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) sets out a two-track approach to inclusion that involves providing specialist support for children with disabilities, while at the same time promoting generic inclusive strategies. Positive teacher attitudes and perceptions, and specialised knowledge about disabilities, are important in creating an inclusive culture. To ensure access to education, a teacher should be capable of adapting curriculum delivery.

A simplified model of curriculum delivery

Content	*input* →	What and how new information is presented to learners.
Method of presentation, material, learning environment	*processing* →	The methods and activities learners use to understand the context on their own terms.
Method of assessment	*outcome* →	How learners show understanding of what they are learning or have learned.

Children who are blind or have low vision have the same right to access quality education as their sighted peers. They need to be given equitable access through accessible content and reasonable accommodation. This will ensure they acquire what is needed in that subject, have opportunities to participate and achieve, and are prepared for adulthood and working in competitive employment markets.

Specialist support requires teachers to have knowledge of specific ways in which they can assist learners with visual impairment. Having the academic content and skills developed through the core curriculum are not enough to prepare a child with visual impairment for an engaged, meaningful and fulfilling life, where they have agency, choices, and a sense of belonging. Inclusive strategies include the additional content and skills in the Expanded Core Curriculum, which is discussed in the following section.

Additional resources

The following websites and documents contain content about inclusive education policies and strategies within the South African context.

Thuthong South African Education Portal
www.thutong.doe.gov.za/inclusiveeducation

Guidelines for Responding to Learner Diversity in the Classroom
https://www.education.gov.za/Portals/0/Documents/Publications/GUIDELINES%20FOR%20RESPONDING%20TO%20LEARNER%20DIVERSITY%20%20THROUGH%20CAPS%20(FINAL).pdf?ver=2016-02-24-110910-340

Guidelines for Inclusive Teaching and Learning
http://www.ibe.unesco.org/fileadmin/user_upload/archive/curricula/southafrica/sa_ie_gu_2010_eng.pdf

Scoop.it! / Inclusive Education (curated by Marie Schoeman)
http://www.scoop.it/t/inclusive-education-south-africa

Other useful websites and documents with information on international perspectives on inclusive education include:

Brains.org (USA)
www.help4teachers.com
Dr Kathie Nunley's Layered Curriculum includes many useful ideas that can be used for differentiating instruction in the classroom.

Christian Blind Mission (CBM Christoffel-Blindenmission) (Germany)
https://www.cbm.org/news/news/news-2020/launch-of-global-education-monitoring-report-2020/

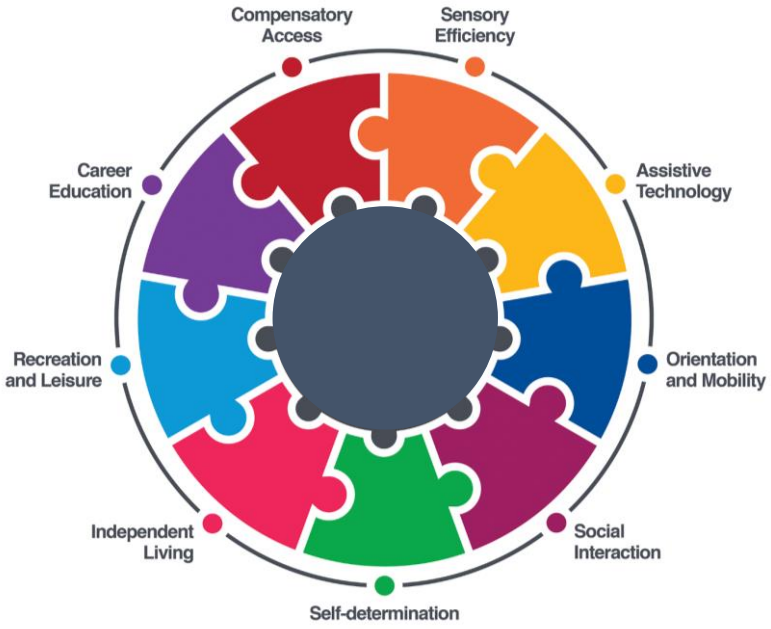
Global Education Monitoring Report 2020: Inclusion and education
https://unesdoc.unesco.org/ark:/48223/pf0000373718/PDF/373718eng.pdf.multi

Light for the World: Inclusive Education – A quick guide
http://www.light-for-the-world.org/inclusive-education-quick-guide

The Expanded Core Curriculum

Knowledge of the academic content and skills in the core curriculum is not enough to prepare an educator for working with learners with visual impairment. While sighted children use visual experiences throughout their lives to learn concepts casually or incidentally, children with visual impairment, with or without additional disabilities, cannot rely on sensory observations. The foundational skills they need for daily life in school, at home and in the community must be strategically taught and integrated into all aspects of their education.

The Expanded Core Curriculum (ECC) is a disability-specific set of skills that focuses on assisting educators to help learners become as independent as possible (inter-dependent), train them for their careers, encourage social engagement, and lead the fullest life possible.



Areas supported through the Expanded Core Curriculum.
Source: Perkins School for the Blind (USA).

Additional resources

The following resources on understanding and implementing the ECC come from a range of schools and organisations that focus on training people with visual impairment.

Perkins School for the Blind (USA): Expanded Core Curriculum (ECC) Hub
https://www.perkins.org/school/ecc

Perkins School for the Blind (USA): Expanded Core Curriculum Guide
https://www.perkins.org/school/ecc/expanded-core-curriculum-download

Texas School for the Blind and Visually Impaired (USA): What is the Expanded Core Curriculum?
https://www.tsbvi.edu/images/ecc-flyer.pdf

Texas School for the Blind and Visually Impaired (USA): Expanded Core Curriculum Resources
https://www.tsbvi.edu/selected-resource-topics/4472-expanded-core-curriculum-areas

Teaching Students with Visual Impairments (USA): The Expanded Core Curriculum for Students who are Blind or Visually Impaired
https://www.teachingvisuallyimpaired.com/the-expanded-core-curriculum

Paths to Literacy (USA): Expanded Core Curriculum
https://www.pathstoliteracy.org/expanded-core-curriculum

Pinterest: Expanded Core Curriculum
https://za.pinterest.com/officialperkins/expanded-core-curriculum/

Utah Schools for the Deaf and the Blind (USA): Expanded Core Curriculum
https://www.usdb.org/programs/blind-visually-impaired/expanded-core-curriculum/

Facebook (public group): 9 More Than Core
https://www.facebook.com/groups/1449828062389 24
9 More Than Core is a Facebook group where you can share ideas, plans and pictures for learners with vision impairment, and ask questions and get support for teaching the ECC.

Active Learning Space (USA): Orientation and Mobility
https://activelearningspace.org/implementation/o-and-m/overview-of-orientation-and-mobility

VisionAware (USA): Orientation and Mobility Skills
https://visionaware.org/everyday-living/essential-skills/an-introduction-to-orientation-and-mobility-skills/123/

UEB Online (Australia): Accessible Braille training
https://uebonline.org

BLENNZ (New Zealand): BLENNZ curriculum
http://www.blennz.school.nz/curriculum/blennz-curriculum/

ECC skills (PDFs)

The following links give you direct access to PFD guides on disability-specific skills.

A Self-Help Guide to Nonvisual Skills
http://www.mdsupport.org/guide.pdf

Caring for the Visually Impaired: A handbook of resources for the informal caregiver
https://lowvision.preventblindness.org/wp-content/uploads/2018/10/Caring-for-the-Visually-Impaired-English.pdf

Assisting people who are visually impaired
https://www.cehjournal.org/wp-content/uploads/Assisting-people-who-are-visually-impaired-2.pdf

Benefits of Orientation and Mobility
https://www.tsbvi.edu/attachments/agenda/om-benefits.pdf

Braille Facts
https://www.perkins.org/assets/downloads/research/braille_facts.pdf

The Braille Trail
https://braillebug.org/documents/Braille-Trail-Activity-Book.pdf

How to use the Braille Alphabet
https://www.nbp.org/downloads/alphsamp.pdf

Universal Design for Learning

Universal Design for Learning (UDL) is a research-based framework or approach to teaching and learning that helps to make education accessible to all learners. It is based on the notion that the needs of all learners should be accommodated during the design, implementation and teaching of learning stages and activities. It promotes a set of principles for curriculum development that gives all learners equal opportunities to learn. The ultimate purpose of UDL is to increase access to learning for all learners by removing barriers that impede involvement and engagement.

Principles of UDL

The three overarching principles of UDL that should guide curriculum design, the selection and planning of teaching and learning activities, and the selection of assistive technology for the classroom and individual learners, are:

- **Representation**: Giving learners various ways of acquiring information and knowledge. This means that information and content is presented in different ways, and that different methods of teaching and reaching learning goals are used.
- **Expression**: Differentiating the ways that learners can express what they know. This means that learners are allowed to communicate what they know through various modes of expression, and can demonstrate their proficiency or mastery of a skill through a variety of means.
- **Engagement**: Stimulating interest and motivation for learning using content that is suitable for the varied levels of abilities and preferences/interests of learners. This is achieved by facilitating options and choices of activities and resources.

Additional resources

National Education Association (USA) Policy Brief: Universal Design for Learning (UDL): Making learning accessible and engaging for all students
https://www.kcdsg.org/files/content/Universal%20Design%20for%20Learning%20Overview.pdf

CAST (USA): Universal Design for Learning Guidelines version 2.2
http://udlguidelines.cast.org/

Universal Design

Universal Design refers to the movement within architecture and product development to create places or things that are accessible to as many people as possible, including those with disabilities. Curb ramps, video captioning and speakerphones are examples of universal design elements that we see around us every day. The Center for Universal Design at NC State University (USA) have developed principles and guidelines for Universal Design.

Universal Design principles and guidelines	
Principle	**Guidelines**
1. Equitable use The design is useful and marketable to people with diverse abilities.	**1a.** Provide the same means of use for all users: identical whenever possible; equivalent when not. **1b.** Avoid segregating or stigmatising any users. **1c.** Provisions for privacy, security, and safety should be equally available to all users. **1d.** Make the design appealing to all users.
2. Flexibility in use The design accommodates a wide range of individual preferences and abilities.	**2a.** Provide choice in methods of use. **2b.** Accommodate right- or left-handed access and use. **2c.** Facilitate the user's accuracy and precision. **2d.** Provide adaptability to the user's pace.
3. Simple and intuitive use Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.	**3a.** Eliminate unnecessary complexity. **3b.** Be consistent with user expectations and intuition. **3c.** Accommodate a wide range of literacy and language skills. **3d.** Arrange information consistent with its importance. **3e.** Provide effective prompting and feedback during and after task completion.
4. Perceptible information The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.	**4a.** Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information. **4b.** Provide adequate contrast between essential information and its surroundings. **4c.** Maximise 'legibility' of essential information. **4d.** Differentiate elements in ways that can be described (i.e. make it easy to give instructions or directions). **4e.** Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

5. Tolerance for error The design minimizes hazards and the adverse consequences of accidental or unintended actions.	**5a.** Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded. **5b.** Provide warnings of hazards and errors. **5c.** Provide fail safe features. **5d.** Discourage unconscious action in tasks that require vigilance.
6. Low physical effort The design can be used efficiently and comfortably and with a minimum of fatigue.	**6a.** Allow user to maintain a neutral body position. **6b.** Use reasonable operating forces. **6c.** Minimise repetitive actions. **6d.** Minimise sustained physical effort.
7. Size and space for approach and use Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.	**7a.** Provide a clear line of sight to important elements for any seated or standing user. **7b.** Make reach to all components comfortable for any seated or standing user. **7c.** Accommodate variations in hand and grip size. **7d.** Provide adequate space for the use of assistive devices or personal assistance.

Source: NC State University, The Center for Universal Design

Additional resources

Centre for Excellence in Universal Design (Ireland): What is Universal Design?

http://universaldesign.ie/What-is-Universal-Design/

Braille

Braille (⠃⠗⠁⠊⠇⠇⠑) is a system of raised dots that can be read by touch by people who are blind or have low vision, and visually by those who are sighted. Braille is not a language. It is a code that can be used for reading and writing across many languages.

Research indicates that teaching braille as a primary reading medium to children with visual impairment may encourage them in adulthood to develop a lifelong reading habit and enhance their employment opportunities, thereby increasing their potential for financial independence.

However, a report by the US National Federation of the Blind indicates a decline in braille skills arising from a number of misconceptions:

> *It is often said that technology obviates the need for Braille. The availability of text-to-speech technology and audio texts, for example, is advanced as an argument against the use of Braille. But literacy is the ability to read and write. While using speech output and recorded books is a way for students to gain information, it does not teach them reading and writing skills. Students who rely solely on listening as a means of learning find themselves deficient in areas like spelling and composition.* (p. 12)

The report's findings reflect that braille is hugely important and necessary:

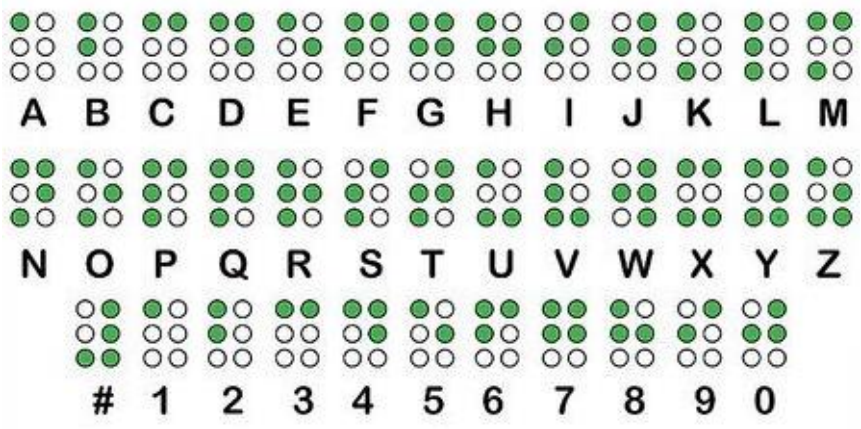
> *But the lives of successful blind people testify to the usefulness of Braille, and in the face of that testimony the only truly professional and moral course of action is to ensure that all blind people have access to competent Braille instruction. In the hearts and minds of blind people, no alternative system or new technology has ever replaced Braille where the rubber meets the road—in the living of happy, successful, productive lives. That is why the National Federation of the Blind is asking all who are concerned about the future prospects for blind children and adults in this country to help us make Braille literacy a reality for the 90 percent of blind children for whom reading is a struggle, if not an impossibility. The future of sighted children depends on a proper education, and the future of blind children is no different. Let us make the commitment that no blind child or adult who needs Braille as a tool in his or her arsenal of blindness techniques will be left without it.* (p. 14)

The full report can be found here:

National Federation of the Blind (2009): *The Braille Literacy Crisis in America: Facing the truth, reversing the trend, empowering the blind*
https://www.nfb.org//images/nfb/documents/pdf/braille_literacy_report_web.pdf

Writing braille

Braille symbols are formed within units of space known as braille cells. A braille cell consists of six raised dots arranged. Sixty-four combinations are possible using one or more of these six dots. A single cell can be used to represent an alphabet letter, a number, a punctuation mark, or even a whole word.



Braille alphabet and numbers.
Source: wikiHow, https://www.wikihow.com/Read-Braille#sample_Printable-Braille-Alphabet

Braille may be produced in several ways: by hand using a slate and stylus in which each dot is created from the back of the page (writing in mirror image); on a braille typewriter or Perkins Brailler; or an electronic Brailler or eBrailler.

A braille writer has only six keys, a space bar, a line spacer, and a backspace. The six main keys are numbered to match the six dots of a braille cell. Because most braille symbols are made up of more than one dot, combinations of the braille writer keys can be pushed at the same time.

Because braille letters cannot be erased, an error is overwritten with all six dots (⠿). Using a computer or other electronic device, Braille may be produced with a braille embosser (printer) or a refreshable braille display (screen).

Technological developments have provided and continue to expand additional avenues of literacy for braille users. Software programs and portable electronic braille devices allow users to save and edit their writing, have it displayed back to them either verbally or tactually, and produce a hard copy using a braille embosser. Because the use of computers is so common in schools, children learn braille contractions and how to spell words out letter for letter so they can spell and write using a keyboard.

Reading braille

Given that Braille is one of the few writing systems where tactile rather than visual perception is used, a braille reader must develop a different skill set. There are many ways of understanding and developing braille reading techniques, and many debates about whether one technique is better than another. While research has shown that a few braille readers use only one hand to read, the vast majority use both hands.

The following characteristics are typical of the majority of good braille readers. The student:

- exhibits few regressive hand movements (either vertically or horizontally)
- uses very little pressure when touching the braille dots
- utilises a two-handed reading technique in which the left hand locates the beginning of the next line, while the right hand finishes reading the previous line
- uses at least four fingers at all times
- demonstrates the ability to scan efficiently when reading both a vertical and horizontal format, and
- demonstrates the ability to read letters accurately without confusing letters that are mirror images of other letters.

A teacher needs to be trained in braille before they can teach learners how to read and write braille. The practice of reading and writing in braille should not be approached any differently from teaching a sighted child to read and write.

Additional resources

Perkins School for the Blind: Teaching Braille Reading and Writing
https://www.perkinselearning.org/videos/webcast/teaching-braille-reading-writing

BrailleWorks: A Brief Review of Reading and Writing Braille
https://brailleworks.com/reading-and-writing-braille/

The following link is to a resource that discusses and proposes ideas for teaching braille remotely, as necessitated by the challenges of COVID-19. Although it is American-based and may seem to contain little that can be applied in South Africa, it is interesting to note what is being done abroad.

Paths to Literacy: Suggestions for Teaching Braille Reading and Writing Remotely
https://www.pathstoliteracy.org/news/suggestions-teaching-braille-reading-and-writing-remotely

Technology and digital accessibility for the visually impaired

Technology and digital accessibility for people with visual impairment has advanced considerably during the last decade. As a result of the rapid pace at which development is taking place, information is often outdated soon after its publication. The following are mere snapshots of the content available on the Internet.

W3C: Accessibility Requirements for People with Low Vision
https://www.w3.org/TR/low-vision-needs/
This site offers guidance on what people with low vision need for electronic content, tools and technologies to be accessible.

Described and Captioned Media Program: The Description Key
https://dcmp.org/learn/624-welcome-to-the-description-key
This site contains detailed information on audio description and suggests 'whenever possible, you should describe the visual action in terms of the viewer's body, or use body terms that children with visual impairment can relate to their own bodies'.

YouTube
https://www.youtube.com/
YouTube provides tutorials on, for example, using a screen reader, and has enabled keyboard shortcuts that automatically take blind users to key features such as the search bar.

There is also a thriving community of blind creators on YouTube. These creators have not only become voices for the visually impaired, advocating for equity, but also create content on a range of topics, including digital accessibility.

Meet the Blind YouTubers Making the Internet More Accessible
https://www.wired.com/story/blind-youtube-creators/
This article contains hyperlinks to several creators' sites.

YouTube: The Blind Life
https://www.youtube.com/c/theblindlife/about
This vlogger particularly focuses on accessibility issues for people with low vision.

Life of a Blind Girl
https://lifeofablindgirl.com/2020/05/24/the-importance-of-the-online-disabled-community/
Molly Tuck writes about the importance of the online disabled community. She is an assistive technology advisor and her blog contains useful advice and tips.

Resources for visual impairment and other disabilities

The following links access resources that relate to visual impairment (blindness and low vision) and other disabilities.

Hadley: Braille
https://hadley.edu/workshops/braille

Hadley: Android – Low Vision Features Series
https://hadley.edu/workshops/android-low-vision-features-series

Hadley: Labels for Everyday Use Series
https://hadley.edu/workshops/labels-for-everyday-use-series

Interior Design Disability Guide: Lost and Found – Lighting in Dark Spaces
https://iddguide.wordpress.com/2020/04/23/lost-and-found-lighting-in-dark-spaces/

Interior Design Disability Guide: Best Signage for People with Visual Challenges
https://iddguide.wordpress.com/2020/06/25/best-signage-for-people-with-visual-challenges/

The International Council for Education of People with Visual Impairment (ICEVI)
https://icevi.org/

ICEVI: The Educator
http://icevi.org/educator/
Links to PDFs that relate to transition to adulthood, partnerships in early intervention, parental involvement and innovative educational practices.

World Blind Union: Resources
https://worldblindunion.org/resources/
The website includes toolkits on a range of topics, including the implementation of disability-inclusive strategies in development efforts.

The following blogs are written by people with visual impairment and relate their lived experiences on a broad range of topics:

The Independent Little Bee…
http://adifferentkindofvision.blogspot.com/

Learning Blindness
https://learningblindness.wordpress.com/

Going Blind With Insight
https://goingblindwithinsight.wordpress.com/

Twitter and Facebook can connect you to a wide range of support networks, including schools for the visually impaired, disability activists, organisations for the blind, and people who are interested in and knowledgeable about disability-specific skills.

Twitter: Perkins School for the Blind
https://twitter.com/perkinsvision/status/1275797591159189505

Twitter: Dr Amy Kavanagh
https://twitter.com/BlondeHistorian

Facebook: Braille: Learning and networking for sighted people learning Braille
https://www.facebook.com/groups/1711873862428566

Facebook: Utah School for the Blind
https://www.facebook.com/utahschoolblind

Facebook: Technology for Blind and Visually Impaired
https://www.facebook.com/groups/1870565113191997

Facebook: Teachers of the Blind and Visually Impaired/O&M Specialists
https://www.facebook.com/groups/393880850642344/

Facebook: Blind and visually impaired support group
https://www.facebook.com/groups/2590087376311l8/

Resources for parents and teachers

Resources intended for parents of children with visual impairment are also valuable for teachers. Although the following websites to various international organisations and schools for the visually impaired are not specific to the South African context, they contain tips and ideas that can be adapted and applied in many situations.

Physical space at home

Many parents are concerned about the ability of their visually impaired child to get around their home safely. The following links may be useful in identifying relatively simple things that can be done to promote safe movement at home.

FamilyConnect: Adapting your home for a child who is blind or has low vision
https://familyconnect.org/after-the-diagnosis/adapting-your-home/

VisionAware: Organizing and modifying your home
https://visionaware.org/everyday-living/home-modification-/

VisionAware: Household organization
https://visionaware.org/everyday-living/home-modification/room-by-room/household-organization/

Interior Design Disability Guide
https://iddguide.wordpress.com/

Family life

It can be challenging to make sure that the siblings of a child with visual impairment do not feel left out (or vice versa). This site offers tips for encouraging healthy relationships:

FamilyConnect: Five tips to encourage healthy relationships between blind children and their siblings
https://familyconnect.org/after-the-diagnosis/emotional-impact/5-tips-to-encourage-healthy-relationships-with-siblings/

Outings and activities

It is sometimes assumed that certain activities cannot be done by children with visual impairment. These links may assist with thinking outside the box:

Thrive: Carry on Gardening
https://www.carryongardening.org.uk/gardening-for-blind-and-partially-sighted-people.aspx

FamilyConnect: An Adventure in Summer ECC Skills: Plan a Day Trip
https://familyconnect.org/blog/familyconnect-a-parents-voice/an-adventure-in-summer-ecc-skills-plan-a-day-trip/

Social life

Various aspects of social skills are learnt by observation, including eye contact, interpreting facial expression and body language. Children with visual impairment miss out on these incidental learning moments, which means that parents need to approach these aspects differently to the way they would with children who can see.

FamilyConnect: Helping your child who is blind or visually impaired learn how to make friends
https://familyconnect.org/browse-by-age/grade-schoolers/social-life-and-recreation-grade-schoolers/learning-how-to-make-friends/1235/

Transition to adulthood

The following links are examples of the wealth of information available on this topic. The majority of American and British schools for the visually impaired have detailed information about this on their websites.

FamilyConnect: Empowering your teen who is blind or visually impaired for adulthood
https://familyconnect.org/blog/familyconnect-a-parents-voice/empowering-your-teen-who-is-blind-or-visually-impaired-for-adulthood/

FamilyConnect: High expectations for your graduate with vision loss (from Pre-K to High School)
https://familyconnect.org/blog/familyconnect-a-parents-voice/high-expectations-for-your-graduate-with-vision-loss-from-pre-k-to-high-school/12/

Teaching Students with Visual Impairments: Independent Living for Individuals who are Blind or Visually Impaired
https://www.teachingvisuallyimpaired.com/independent-living.html

Transition Planning Asia: Sample Transition Plans
http://www.transitionplanningasia.org/sample-transition-plans

Braille

If your child is a possible candidate for braille reading and writing, it is helpful to understand the typical braille teaching process and to learn how to prepare your child for a successful learning experience.

FamilyConnect: How Braille is taught and how you can help
https://familyconnect.org/education/literacy/braille/how-braille-is-taught-and-how-you-can-help/1345/

The following link provides tips on how to promote braille awareness in your community.

American Foundation for the Blind: Tips for Promoting Braille in Your Community
https://www.afb.org/blindness-and-low-vision/braille/resources-teachers-braille/tips-promoting-braille-your-community

General

The Vision Book: My Child, Our Journey is a digital book for parents, caregivers, and families of children and young people who are blind, deafblind, or have low vision. It was written by the New Zealand Ministry of Education with help from the Ministry of Health, Blind and Low Vision Education Network NZ (BLENNZ), the Blind Foundation, community groups, parents and professionals throughout New Zealand. Although it focuses on services and resources in New Zealand, it has many tips that can be applied anywhere in the world.

BLENNZ: The Vision Book
https://www.blennz.school.nz/guides-and-resources/the-vision-book/

Cover photo: StockSnap at Pixabay

TEACHER EMPOWERMENT FOR DISABILITY INCLUSION

This Resource Guide for Teachers of Children with Visual Impairment has been created as a supplement to TEDI's Teaching Learners with Visual Impairment (low vision and blindness) course. The course is intended for teachers at special, full service or ordinary schools who have, or may in the future have, learners with visual impairment in their classes. This resource guide can also be used by parents, principals, district officials and members of district-based support teams. Links to various topics that are relevant to teachers, support staff and parents in supporting learners with visual impairment are included.

cbm
together we can do more

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Project co-funded by the European Union