

UNIT 1

VISUAL IMPAIRMENT

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1. Visual proces
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3. Optical, non-optical and electronic devices for people with low vision

OBJECTIVES

- To know the anatomy and physiology of the eye
- To classify visual impairments
- To identify optical, non-optical and electronic devices for people with low vision

1. VISUAL PROCESS

2. Eye anatomy

Vision is by far the most used of the five senses and is one of the primary means that we use to gather information from our surroundings. More than 75% of the information we receive about the world around us consists of visual information. The eye is often compared to a camera. Each gathers light and then transforms that light into a "picture." Both also have lenses to focus the incoming light. Just as a camera focuses light onto the film to create a picture, the eye focuses light onto a specialized layer of cells, called the retina, to produce an image.

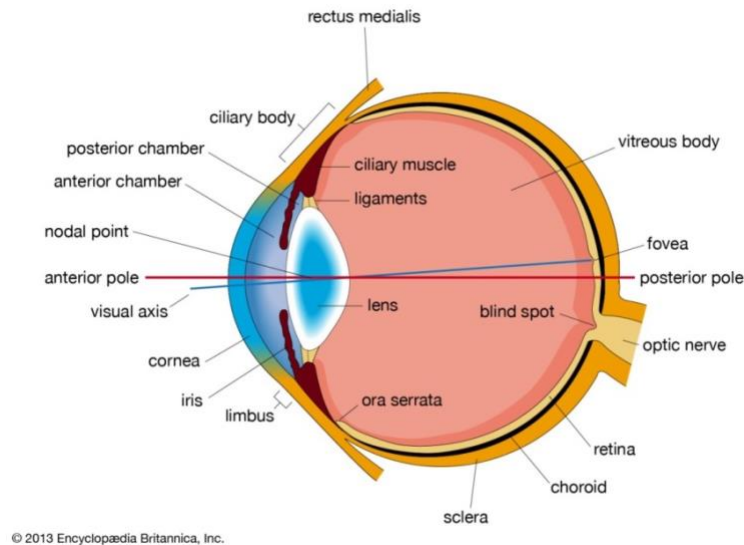


Image description: Horizontal section of the eye.

There are three layers in the eye anatomy, what ophthalmologists call tunics.

The **first layer** is the cornea and sclera.

The **second layer** is the vascular tunic called the uvea, which includes the iris (which surrounds the pupil), the ciliary body, and the choroid.

The **third layer** is the retina, which rests on the inside surface of the back of the eyeball.

The Cornea and Sclera

The transparent cornea protects your eye anatomy from damage, helps maintain its shape, and, to some extent, bends light toward the lens. The cornea is surrounded by the opaque sclera, the white of the eye anatomy, which surrounds the entire eyeball and also helps maintain the eye's shape. The cornea and sclera are both made of collagen, which gives this layer its toughness and ability to maintain the shape of the eye.

The iris, ciliary body, and choroid



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The iris, the colored part of the eye, surrounds the pupil. The pupil is, in a sense, nothing. The pupil is the hole at the front of the eyeball where light enters the eye anatomy. The size of this hole is regulated by the iris.

The iris shrinks the size of the pupil in bright light **(to reduce damage caused by too much radiation)**, and dilates it in dim or dark conditions **(so that as much light as possible enters the eye)**.

The ciliary body is the set of muscles and ligaments that control the shape of the lens so that light from both nearby and distant objects can be focused onto the retina. The ciliary body also produces the aqueous humor, a thin fluid that fills the space between the cornea and the lens. The aqueous humor provides glucose, proteins and oxygen to the cornea, iris and lens.

The choroid contains the small arteries that supply oxygen and nutrients to the front of the eye anatomy. It is also made up of the small veins that remove the waste products from this area. The choroid rests on the inside wall of the eyeball.

The Retina

The retina is made up of several parts. The entire retinal layer rests on the choroid, and is separated from it by Bruch's membrane, a thin film of collagen.

Sitting on top of this membrane is the retinal pigment epithelium (RPE). The RPE is a layer of cells that nourish the photoreceptors. The RPE acts in much the same way as the soil in a garden nourishes the plants that grow in it. The photoreceptors are the rod-shaped and cone-shaped cells that convert the light entering your eye into electrical signals that are passed on to the brain. There are about six million cones and 120 million rods.

The cones allow detailed vision, central vision, and colors (in brightly lit circumstances).

The rods are responsible for all night vision and peripheral vision.

Photoreceptors wear out, and are constantly replaced with the help of the RPE.



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They contain a protein called rhodopsin (also called retinal purple and visual purple), which contains Vitamin A. They also contain high concentrations of polyunsaturated fats.

On the tops of the photoreceptors are nerve cells and fiber layers. These cells transmit the signals created by the photoreceptors to the optic nerve. Retinal blood vessels in the nerve cell layers provide these cells with nutrients. Retinal glial cells provide structural support inside the retina.

The two chambers

There are two chambers, or compartments, inside the eye.

The anterior (meaning front) chamber is the space between the cornea and the lens/ciliary body. It's filled with the aqueous humor, a fluid that provides the nutrients to the front parts of the eye, and maintains the internal pressure of the eye. (The lens has no nerves or blood vessels, and so is completely dependent on the aqueous humor for its nourishment and removal of waste products.)

The vitreous cavity takes up the middle and back of the eye. The vitreous humor, which fills the remaining 80% of the hollow part of the eye, is a clear substance with the texture of an egg white. It is made up of collagen, a protein.

On the Outside

On the outside of the eye are the extraocular muscles, a set of six muscles that control the movement of the eye up and down, side to side, and from the top left to the bottom right and vice versa. The eyelid and eyelashes protect the eye from foreign bodies and too bright light.

The tear duct lubricates the outer surface of the eye so that the cornea is not damaged. The eyeball rests in the orbital socket. This socket is lined with fatty



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tissues, which protect the eyeball from trauma. Also on the outside is the optic nerve, which carries the electrical signals to the visual cortex of the brain.

1.1.2 The physiology of vision

There are three separate processes that make up the visual process:

- Mechanical
- Chemical
- Electrical processes

The mechanical process

The first part of the visual process is mechanical. Light passes through the Cornea and the pupil to the lens. The cornea's shape focuses the incoming light slightly before it enters the lens.

Some people have an irregularly shaped cornea, which changes the refractive power in that area. This results in blurry vision, known as an eye astigmatism, which can be corrected for.

The iris determines the size of the pupil. In bright light, the iris shrinks the pupil, which lets in less light. In dim light, the iris expands the pupil, letting in more light. The light then passes through the lens, which bends it and focuses it onto the photoreceptors.

The ciliary muscles and ligaments cause the lens to change shape, which allows the lens to focus light from both distant and nearby objects onto the retina. This process is called accommodation. As your body ages, the lens becomes less flexible.

Accommodation is reduced, and the eye's ability to focus on nearby objects is lessened. This condition is known as presbyopia, and is corrected with prescription glasses or contact lenses.

The chemical process

The second part of the visual process is chemical. The photoreceptors receive the light and convert it into electrical signals. The cones are active in bright light conditions.

They detect and interpret colors, can pick up small changes (visual acuity), such as threading a needle, and are the photoreceptors that pick up the signals coming from the center of the visual field.

The rods are active in dim conditions, picking up small bits of light from here and there, and are used for peripheral vision. Rods cannot provide visual acuity, and thus, seeing in the dark and at the edges of vision are usually fuzzy and slightly unfocused.

The electrical process

The third part of the visual process is electrical. Once the photoreceptors convert the light into electrical signals, the nerve cells that sit on top of the rods and cones pick up the signals and carry them to the optic nerve. The optic nerve takes the signals to the visual cortex, where the brain reinterprets the signals as what you are seeing.

1.2. CLASSIFICATION OF VISUAL IMPAIRMENT

Visual impairment is a decreased ability to see to a degree that causes problems not fixable by usual means, such as glasses. Visual impairment may cause people difficulties with normal daily activities such as driving, reading, socializing, and walking.

The World Health Organization estimates that as of 2012 there were 285 million people who were visually impaired in the world, of which 246 million had low vision and 39 million were blind. The majority of people with poor vision are in the

developing world and are over the age of 50 years. 80% of visual impairment is either preventable or curable with treatment.

The definition of visual impairment is reduced vision not corrected by glasses or contact lenses. The World Health Organization uses the following classifications of visual impairment. When the vision in the better eye with best possible glasses correction is:

- 20/30 to 20/60 : is considered mild vision loss, or near-normal vision
- 20/70 to 20/160 : is considered moderate visual impairment, or moderate low vision
- 20/200 to 20/400 : is considered severe visual impairment, or severe low vision
- 20/500 to 20/1,000 : is considered profound visual impairment, or profound low vision
- More than 20/1,000 : is considered near-total visual impairment, or near total blindness
- No light perception (NLP) : is considered total visual impairment, or total blindness

Blindness is defined by the World Health Organization as vision in a person's best eye with best correction of less than 20/500 or a visual field of less than 10 degrees. This definition was set in 1972, and there is ongoing discussion as to whether it should be altered to officially include uncorrected refractive errors (near-sightedness, far-sightedness, presbyopia, and astigmatism)

The most common causes of visual impairment globally are:

1. Refractive error
2. Cataract
3. Glaucoma
4. Age-related macular degeneration
5. Corneal opacification
6. Diabetic retinopathy

7. Childhood blindness
8. Trachoma
9. Undetermined

The most common causes of blindness worldwide are:

1. Cataracts
2. Glaucoma
3. Age-related macular degeneration
4. Corneal opacification
5. Childhood blindness
6. Refractive errors
7. Trachoma
8. Diabetic retinopathy
9. Undetermined

About 90% of people who are visually impaired live in the developing world. Age-related macular degeneration, glaucoma, and diabetic retinopathy are the leading causes of blindness in the developed world.

1.3. OPTICAL, NON-OPTICAL AND ELECTRONIC DEVICES FOR PEOPLE WITH LOW VISION

Low vision devices can help you make the most of your vision so that you can perform everyday tasks more easily and with less frustration. Some devices, such as optical and non-optical aids, offer very simple and relatively inexpensive solutions. Other devices, such as electronic and digital magnifiers, may be slightly more complex and costly. However, both optical devices and electronic or digital devices require training to use them efficiently and effectively. Training is always one of the main keys to success with the use of low vision devices. There are several different categories of low vision devices: optical devices, non-optical devices, and electronic devices. Low vision devices are task-specific, designed

for close-up visual tasks or distance viewing. You may require several different devices to accomplish different tasks, depending upon your eye condition and your everyday living needs.

Low vision optical devices

Low vision optical devices include a variety of helpful visual aids, including stand and hand-held magnifiers, strong magnifying reading glasses, loupes, and small telescopes. Because these devices can provide greatly increased magnification powers and prescription strengths, along with higher-quality optics (i.e., the way the lens bends or refracts light), they are different from regular glasses and magnifiers that you can buy in a local store or online. Most often they require training to help you use them effectively.

Optical aids use magnifying lenses to make objects look larger and easier to see.

- **Correctly refracted glasses.** The child needs a proper cycloplegic refraction (with eye drops), and measurement of accommodation (ability to see close up when reading or playing). Children with low vision may benefit from glasses earlier and at lower or more specialized prescriptions than a child with vision that's developing more typically.
- **Magnifying spectacles.** Magnifying spectacles are worn like eyeglasses to keep your hands free. They can be used for reading, threading a needle or doing other close-up tasks. Often objects need to be held much closer with these magnifying glasses than with regular reading glasses or bifocals.
- **Stand magnifiers.** These magnifiers rest above the object you are looking at. This helps to keep the magnifying lens at a proper distance. Being on a stand also is helpful to people who have a tremor or arthritis. Some stand magnifiers have built-in lights.

- **Hand-held magnifiers.** These are magnifiers to hold over print material. Some models have built-in lights.
- **Telescopes.** These are used to see objects or signs far away. Some telescopes can be attached to eyeglasses. Others are held like binoculars.

Low vision non-optical devices

Low vision non-optical devices can include adaptations such as reading stands, supplemental lighting, absorptive (or glare control) sunglasses, typoscopes, and tactile locator dots. They can be used in combination with low vision optical devices and can help with reading, organizing, labeling, and a variety of everyday tasks.

- Watches, timers and devices with **audible announcements** to measure blood pressure or blood glucose.
- **Large-print** books, newspapers, magazines, playing cards and bank checks
- **Audible books**
- **Telephones, thermostats, watches and remote controls** with large-sized numbers and high-contrast colors
- **Needle threaders, magnifying mirrors and tactile (textured) labels**

Low vision electronic devices

Electronic magnifying systems come in many different varieties and sizes, depending upon the task or activity you want, or need, to do. Some have a camera system that displays a magnified image on a monitor, which can be helpful for reading mail, books, and magazines, while others are hand-held, portable, and can be taken to the supermarket to read labels and coupons, or to restaurants for reading menus.



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- **Video magnifiers.** These electronic devices are available in portable and desk formats. They combine a camera and a screen to magnify printed pages, pictures or other small objects. You can adjust them to meet your special vision needs. For instance, you can add contrast to make printed words darker. Some video magnifiers can read text aloud. There are many new video magnifiers. The vision rehabilitation team will be knowledgeable about current technology and what can be provided at home or in the classroom.
- **Audio books and electronic books.** With audio books, you can listen to text that is read aloud. With electronic books like Kindle, Nook and others, you can increase word size and contrast.
- **Smartphones and tablets** let you change text size, adjust contrast and use voice commands. There also are many apps to choose from, such as programs that read material aloud, magnify or illuminate.
- **Computers** can usually read aloud or magnify what is on the screen.

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UNIT 2. Psychosocial incidence of visual disability

- 2.1. Movement and orientation in space
- 2.2. Personal autonomy and adaptive behaviors
- 2.3. Diversity of visual impaired people/students

General objectives:

1. To know the impact of visual impairment on the family and on the subject's development.
2. Value the importance of maintaining an empathetic attitude.
3. To know the specific needs of people with visual impairment: autonomy in moving around, adaptive behavior, social interactions, etc.
4. Understand that people with visual impairment are diverse depending on factors such as the type of visual pathology, the time of its appearance and other personal and social factors.

When an individual contracts a deficit, the impact can be devastating (Harvey, Dixon and Padberg, 1995), but not only for the sufferer, but also for those around them, family members and significant others (...). Feelings of helplessness and fear, grief and guilt emerge in parents (Parker, 1993). Parents usually generate expectations about what their child will be like, what he/she will study, what his/her hobbies will be, etc., but all of them disappear and from the moment of the



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child's diagnosis, they will go through critical moments of adaptation to the new situation. The family had not built up expectations of having a child with visual impairment. These families need constant support from the moment of diagnosis. Any new challenge or change, such as a new educational stage, adolescence, entering university, entering the world of work, etc., puts the family on alert and confronts them with a new situation and they therefore need a new adjustment in their roles, social relations and organization (Leyser and Heinze, 2001).

The attitude of professionals and the social environment is key. An empathetic and supportive attitude helps to reduce distress and frustration. The family environment is also unprepared to adapt to the presence of a member with a disability in the family, which usually generates all kinds of opinions and attitudes; from anxiety to the role of judge over the actions of the parents, who feel observed and valued at every step. Observing distress in their environment and remaining under the microscope does not usually help them to adapt to the new situation; on the contrary, it leads them to get an idea of what they should do so that others do not consider them to be bad parents. Many protective behaviors towards the child may appear out of fear but also to avoid negative judgement from others.

It is not the same if the disability is acquired, and the family's response will be different according to the child's stage of development. In general, the concerns that arise are different, but the impact is also enormous.

From the point of view of the child with DV, we must bear in mind that they are first-person observers of what happens in their family, and the responses that are given have a direct impact on their evolution.



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Growing up in a family that is unable to overcome fear and uncertainty will not be the same as growing up in a family whose behavior is more in line with that of any other son or daughter. It will certainly affect them to hear remarks of pity about them. In short, for them the world in which they have developed is the normal world, but this does not mean that they are not capable of reflecting on what is happening in their family.

The child discovers his or her disability as he or she evolves in school. Each new change or each new situation will make them notice the differences in the most basic activities. This potentially generates a feeling of dependency. Having a different development than their peers as well as different strategies to cope with educational and daily activities also depends on their visual situation, their personality or the behavioral demands of their school and family environment.

Adolescence is a particularly different period, with changes in physiological and social demands. The balance between their strategies for dealing with change and what is expected of them, or simply facing new situations for which they have no strategies or which they do not know how to deal with, are moments that can stress them or lead them to adopt an attitude of waiting for others to provide a solution. Students often do not know how to react or become frustrated when a teacher tells them that they cannot participate in a certain activity, or when, despite repeated requests, they are not offered the activities or documents in an accessible format. They may also face conflicts with their family when they demand more independence, because they want to be more autonomous and meet other young people. Desires for independence and peer relationships are partly determined by the young person's evolving autonomy. Decisions about the future and the educational challenges to

be taken up are a source of uncertainty if teachers are not prepared to guide them and it is time to find other support.

1. Visual impairment and blindness cause a great change in the expectations of the family and the school, to the point of not knowing how to deal with the different stages of the child.
2. Adolescence is a critical period due to the changes that occur at this stage and the demands for independence on the part of the adolescent.
3. The environment in which the child with VI or blindness grows up will be influenced by his or her own characteristics (type of visual pathology, personality) and by the expectations of his or her family and school environment, including the school.
4. Empathy and support is the best help we can offer.

2.1. Movement and orientation in space

Mobility skills for people with VI from a practitioner's point of view have traditionally been referred to as Orientation and Mobility programs. Hill (1976) states that: "Orientation is the ability to use one's remaining senses to understand one's position in the environment at a given time. Mobility is the ability or ease of movement". These programs can be described as including the concepts, skills and abilities necessary to move around safely, effectively and autonomously for a visually impaired person. It is clear that both concepts, orientation and mobility, cannot occur without each other, in the sense that it is necessary to relate conceptually (be oriented) to space in order to be able to move through it.

Progressively learning to control space and to move around safely is one of the most important challenges for people with DV and they are often subject to the expectations of their environment: family, school, social environment in general. In general, these expectations are often negative, as they emphasize the danger that moving around can bring,



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as opposed to the advantages of participation in society and being able to live a normal life, the same as their peers. As a consequence, the development of these people is often delayed in the acquisition of mobility skills and this hinders their incorporation into different activities or at least their participation as equals.

Moving around is a complex activity for visually impaired people. It requires a significant degree of skill and concentration: controlling environmental information (tactile, auditory), memorizing the route and the elements that make it up, generating a mental image of the route that allows them to keep their bearings, being alert to dangerous situations such as crossings or open spaces, etc. It is an activity that can generate a level of stress and that can be carried out with a different level of safety depending on environmental conditions such as the type of light, the noise level, the complexity of the environment, the number of people, etc. In adolescence and early youth, autonomy in movement becomes key and makes a difference in terms of social and educational participation. It can be the condition that makes the difference between having social relations or not, between participating in some leisure and educational activities or not, or being considered valid for some educational options.

At the European level, there are professionals who specifically train these students with VI in the skills that enable them to be autonomous in movement and to lead a normalized social and educational life. These specialists assess the subject's abilities and skills and teach them new skills that may include the use of sunscreens, optical aids such as a telescope, the use of mobility aids such as a white cane, and orientation skills using various concepts and their senses. When they reach the age of majority, these individuals may also apply for a guide dog, the use of



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which is regulated differently depending on the different agencies that provide them and the legislation of the country in which they are located.

Also, the use of various mobile applications that geolocate the subject and provide information about the environment and the direction to follow is becoming more and more common.

Currently, there are few digital resources for indoor orientation and movement. The most common resource for these environments is the so-called "familiarization", which, briefly expressed, consists of walking around the perimeter of the room or the route to check the order of its elements, references, calculate distances and configure an image of the route or space and the turns to be made.

Experience tells us that the fact of moving around the educational centre independently tends to be a fact that rarely happens due to the protection that the educational centre exercises over the subject with low vision or blindness, or in a limited way in the majority of cases, establishing a safe route and preventing them from making most of the movements without the company of another person. How do you think this can affect the image that the person with low vision or blindness has of him/herself?

Learning to move around the school independently and making the journey to and from home not only puts the student on an equal footing with his or her classmates but can also generate a positive image of his or her environment towards him or her.

There are different resources and ways of getting around depending on the circumstances:

- Guide technique: The most appropriate procedure for walking accompanied by a sighted guide.
- Mobility cane: Use of the white cane to avoid obstacles and drops, as well as to obtain information about the ground and the environment.

- Guide dog: only people of legal age are likely to use this resource in which the dog detects and avoids obstacles, warns of steps and locates specific landmarks such as a crossing point or a bus stop, for example.

Guide Techniques for people who are blind or visual impaired (English) 10:25 min

1. Moving around with blindness or visual impairment is a complex activity, requiring a high level of concentration and the learning of skills.
2. There are several ways of getting around: with a sighted guide, with a cane or with a guide dog. They are not mutually exclusive.
3. The way in which the child has been raised and his or her experience in moving around will determine whether he or she will be able to move around independently by the time he or she reaches adolescence.
4. In the school and family environment, fear of the risks of displacement sometimes prevails over offering the possibility of developing the full capacity of the person who is blind

2.2. Personal autonomy and adaptive behaviors

If we focus on daily living skills and activities, the WHO defines them as: "those skills necessary for appropriate and positive behaviour, which enable us to cope effectively with the demands and challenges of everyday life". In the professional practice of visual impairment specialists, these skills have traditionally been categorised into a set of activities, subdivided into different areas of daily life of any person. This and other similar classifications are intended to encompass any activity that people carry out in their daily lives.

The concept of adaptive behavior comes from the AAMR (American Association for Mental Retardation) which defines it as "the set



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of conceptual, social and practical skills that have been learned by people to function in their daily lives" (AAMR 2004, p.97). We are talking about activities related to self-care (dressing, grooming, administering medication, eating), household activities, shopping or participating in leisure activities.

The student's performance in these activities will depend on his or her personal resources (visual limitations, motor skills, spatial orientation capacity, etc.), social resources (family support, resources of the social environment, etc.). During the process of developing these activities it is possible that we may encounter some difficulties due to different causes, so we must turn to other resources such as order, simplification of activities, marking of rooms, spaces, electrical appliances and products, or support from other people. It is essential to maintain order in a room and to ensure that the person with VI is alerted to any changes when they occur. Adequate lighting of a space can favour the performance of the person as well as correct visual and tactile signposting. In some spaces, for example, signs are of a size and contrast that makes it possible for anyone to read them. An example that can often occur among students is participation in games or leisure activities, use of the gymnasium or accompanying them to the toilet. These are circumstances in which if the student does not have sufficient skills or the environment is new to him/her, he/she will require the participation of peers and sometimes they do not know how to behave. The main guideline to bear in mind is always naturalness; ask if they need help and what kind of help, and offer them our arm so that they can take it and we can accompany or guide them to the toilet, the gym locker or the shower, etc.

Often changes in classroom activities, in the environment, in the order of the activities themselves, do not involve anything major for most

students, but for some, including those with visual impairment and blindness, it involves changing specific materials, moving specific typewriters, computers or electronic aids. Let us suppose a change of classroom for a special activity on a specific day; this implies that the student has to move his tools, which are sometimes voluminous, go to an environment where he does not usually go so he may need to be guided, as well as move around a different classroom from the usual one, so his knowledge of it is reduced and again he may need help. The same happens when, for whatever reason, we change the configuration of the classroom furniture. The initial surprise of finding various pieces of furniture that have become obstacles will be followed by the attempt to find their table. These changes are often not noticed in advance or are made at the same time the student arrives, leaving the student no time to prepare the materials, learn the new environment, or adapt to the situation. The student feels dependent on others to participate in the activity and the situation highlights certain limitations to others. In cases such as these, simply providing the information in good time and helping him/her to prepare if necessary will allow him/her to participate on an equal basis. **The limitation is not in the person with a disability but in the organization of the educational activity.**

1. By adaptive behaviors we mean all those that any person carries out throughout the day and the way in which they are carried out from a visual impairment: personal care, household activities, leisure activities, among others.
2. Each person with a disability is different depending on factors such as the visual pathology itself, personal abilities, social and family support.
3. Naturalness is the first principle to help a person who needs us to participate in an activity or to carry out a personal task.



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2.3. Diversity of visual impaired people/students

To understand how the visual situation affects the way we perform tasks, whether it is movement, reading or any other task of daily life, we must first review some basic concepts. Different visual pathologies cause certain effects on vision, which can be simply categorized into effects on the field of vision and on the quality of vision. We generally speak of limitations in visual acuity and visual field.

Visual acuity is the ability to perceive and identify an object in good lighting conditions. When visual acuity is severely impaired, the subject is not able to discriminate texts at conventional sizes, to discriminate details in an image or object, etc. People with a significant loss of visual acuity have difficulty performing activities such as reading or studying, seeing a traffic light, reading a sign, shopping, and other daily activities.

We define visual field as the total area that can be seen while keeping sight on a fixed central point. Visual pathologies can produce limitations of various kinds in the visual field, from peripheral reductions of the field reducing it to a central area, the loss of different zones of vision (lateral, superior, inferior, or scattered zones such as blind spots), or the loss of the central zone of vision. People with a peripheral visual field loss often have problems moving in general, and in particular when light conditions are low or adapting to changes in light.

The central area of vision has the highest visual acuity and is used for all major visual tasks requiring high definition, such as reading, recognition of faces and objects, etc. Its loss or limitation implies that the person will need optical or electronic tools that allow them to sufficiently magnify the text or image to be able to see it with sufficient definition.



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They would maintain peripheral vision which, although of poor quality, is very useful for moving around.

According to these concepts, we can say that visual performance among people varies enormously. The different degrees of visual acuity, the extension of the visual field, how the light conditions affect or the moment in which the visual impairment has appeared conditions the way each person behaves, and we can find situations that are apparently contradictory.

An example is the situation of people who, with a visual field reduced to the central area of the retina, can maintain a visual acuity that allows them to read texts in normal size (at least for a short period of time), and yet are unable to find a glass on the table, or who move around without apparent difficulty but stumble over a chair or a rucksack left on the floor, or who, when they suddenly move into an area with a lot or little light, stop for a few moments until they are able to adapt to the new illumination. Some of these people use a cane to move around in certain situations.

Another example is the person who has lost central vision and is therefore unable to recognize details or read without some magnification. They do not seem to have problems recognizing their peers because they use clues such as the other person's clothes, hair or height, but in certain contexts they may not identify a person who should be familiar. They may also show no difficulty in moving around but use electronic or digital devices to amplify information or even receive it in audible form.

Some people with blindness are able to perceive light or large volumes which means that some of their behaviors seem more natural from the sighted person's point of view. In addition, those who have developed age-appropriate personal and social skills tend to be more participative, while others may need constant help with everyday

activities, which may give the impression that people with blindness are generally dependent.

In short, the best way to interact with and understand a visually impaired or blind person is to ask them, avoid labels and prejudices and offer our help in case it may be needed, in a completely natural way.

1. Each person is different due to multiple factors: one of the first is the visual impairment or blindness itself, as no two people see the same way.
2. Environmental conditions can significantly change the way a person sees and/or perceives his or her environment.
3. The impact on the family of the arrival of a child with visual impairment or blindness changes all expectations. the family needs support and empathy.
4. Travelling in school or on the street is a complex activity for which a person prepares himself/herself throughout his/her upbringing.
5. The style of education that the family and the school give to the child with visual impairment or blindness will influence his or her development and the self-image of the person and those around him or her.
6. Trying to understand and get to know the person and their characteristics better is possibly the best way to help them.

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UNIT 3. Accessibility in communication

3.1. Braille

3.2. Universal accessibility for people with visual impairment

3.3. Technical resources for people with blindness and low vision

3.3.1. Adaptation of optical, electronic and digital resources to scientific subjects

General Objectives:

1. To learn about braille literacy and how some electronic devices rely on braille to annotate or receive information.
2. To know the wide variety of optical, electronic, digital and software resources that can be used by students depending on their type of disability.
3. To know some modifications and orientations to consider for the best use of the available resources to carry out studies of scientific subjects.
4. To understand the role of the teaching staff as organizer and anticipator of the resources necessary for the normal development of the studies.

3.1 Braille.

There have been several attempts throughout history to create a reading system for blind people. While Haüy already used relief letters in 1784, it was Barbier who invented letters based on groups of relief dots. Braille used and modified this system in 1825 using one based on six dots, being in 1932 at the London conference of blind educators when this model was established and is now used worldwide.

The Braille code is designed to be explored by touch and its basic unit is formed by the cell, inside which are located a set of dots in relief, in six

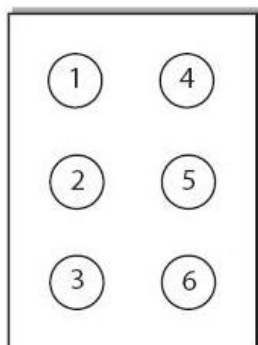


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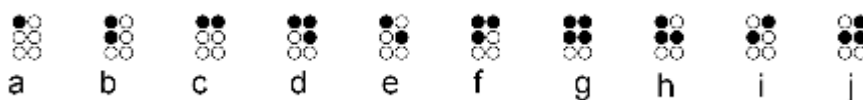
positions, called generator sign. The letters arise from the different combinations of dots, getting 64 different combinations including the sign without dots that is used as a blank space to separate. In addition, to represent some signs it is necessary to combine several characters in Braille because simple combinations would be insufficient. This is the case with numbers, whose representation is the first ten letters of the alphabet preceded by a sign that represents that what follows are numbers instead of letters, or with capital letters that are identified with a preceding sign.

The generator sign is the starting point of all signs and consists of a cell of a certain size for a correct reading with the fingertips. It is represented as a rectangular figure in which we find two columns of three dots each, numbered from one to six from top to bottom in the first column and starting again from top to bottom in the second column.

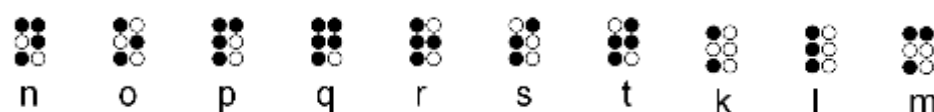


Each letter is formed by a combination of dots, whose number varies. Their position in space is fundamental for the recognition of the letters. Thus, for example, the first ten letters of the alphabet are made up of combinations of

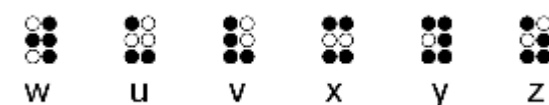
dots from the top four of the box, the dots 1, 2, 4, 5.



The next ten letters are formed by adding dot three to the first ten letters.



The rest of the alphabet is composed by adding point 6 to the letters j, k, l, m, n, o.

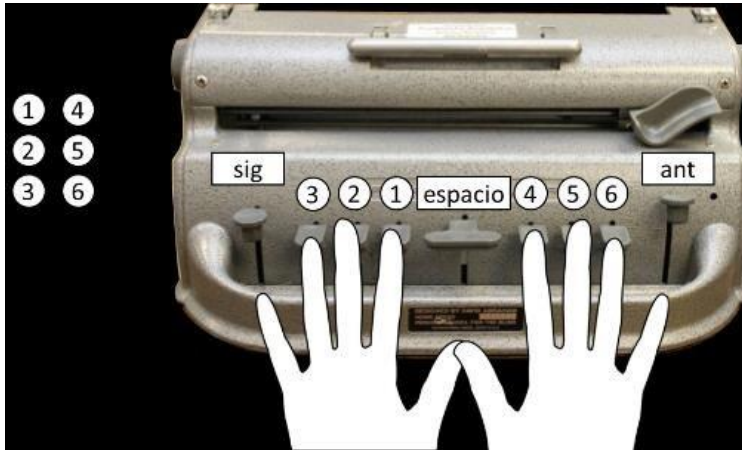


There are also signs for punctuation marks, accented letters, question marks, exclamation marks, hyphens, etc. As already indicated, it is sometimes necessary to use two signs for a different element because the combinations of dots with a single box are limited.

The reading is carried out mainly with the fingertips of the index fingers. The fingers follow the line from left to right and the left hand follows the line and at the end of the line goes down to look for the next one.

For writing, a Perkins machine is generally used, which has the six keys for the dots of the generator sign, three keys on the left 3, 2, 1, and three on the right, 4, 5, 6 (in the same order). On these keys the fingers are placed so that the index fingers are placed on points 1 and 4, the middle fingers on 2 and 5 and the ring finger on 3 and 6. In the middle of the dot keys is another key that serves as a spacer. To the left there is another key to change the line

and to the right to move back one box. The dot keys must be pressed at the same time. For example, if you type the letter "c", press the keys 1 and 4 at the same time.



Some places still use the called " pattern" for writing, on which the braille paper is placed and each dot is marked with a pointer; therefore it is written dot by dot and taking into account that when using the pointer on the paper, the dot will come out downwards, that is to say in the opposite direction to the reading. So we have to write in reverse as if it were a mirror image, that is, from right to left and placing the points 1, 2 and 3 in the right column. Only in this way when turning the paper over will the text be in the correct orientation.

Given the difficulty of representing all the signs from six dots, and due to the widespread use of computers, braille lines, printers, etc., the so-called computerized braille was born, which consists of eight dots. The two new dots are 7 and 8, which are placed respectively under 3 and 6. It also differs from the braille used for reading in the representation of some punctuation marks and symbols.

A good braille reader can reach 120 words per minute, although this is not a rule and sometimes there are people who reach 200 words per minute



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or more. But it is definitely a slower reading system than visual reading, which is more evident from the Secondary Education stage onwards. School activities are more time consuming than for other students without disabilities. It is evident that the performance obtained in learning Braille will not be the same if the person is congenitally blind or blind at birth as if he/she has acquired the disability later in life. In the latter case, their performance will a priori be worse for reading, so the introduction to technologies will be essential for the student to adapt to the pace of studies. This does not mean that Braille is no longer useful, since on the one hand we will see how Braille writing can be very useful for the use of notebooks and Braille lines, and on the other hand, everyday activities can be carried out more easily if we know this code, since nowadays we find it in pharmaceutical products, food, cleaning products, elevators, signs, etc. In short, Braille is present in many areas of our lives.

It is therefore normal to see a student of a certain age or older sharing books or notes in braille with the use of a computer or other systems such as audio books. In addition, a page in braille takes up more than twice as much space as a page printed in ink, without taking into account that the size and thickness of the paper is also much greater. This makes it difficult to transport and means that from certain educational stages onwards, the text printed in braille gives way to the use of technology and information by auditory means.

The notepads are small devices that can be connected to the computer and independently take and edit notes using a simple file manager, which in some cases contains a braille line of a few boxes, whose keyboard is similar to that of the braille typewriter, which favors its small size.



Picture: braille note taker

The braille line is a device for outputting information in braille code from another device to which it is connected (computers, smartphones, etc.). They are essential for people with deafblindness because it allows them to access information from any device to which it is connected, since neither visually nor audibly can access it. There are several models and can be connected via USB and Bluetooth.

Pictures: braille line



The Braille code emerged in 1825, and it was in 1932 when it was established as the reading system to be used worldwide.

The code is generated from a cell of six raised dots, which constitute the generating sign of all the others. Each point is assigned a number that identifies it and from the combination of these points the letters and other signs are generated. Sometimes it is necessary more than one cell to generate signs, given the limitation of combinations from 6 dots.

The reading is carried out mainly with the fingertips of the index fingers. The fingers follow the line from left to right and the left hand follows the line and at the end of the line goes down to look for the next one.

Braille writing is present in many areas of our lives: medicines, food and other products, signage or elevator buttons.

The writing can be done with the Perkins machine or with a pattern. Note takers also use the braille keyboard.

Notepads are devices that allow text editing and the braille lines receive information from the device to which they are connected (computer, cell phone).

3.2. Universal accessibility for people with visual impairment

The concept of accessibility has evolved until today we consider that it is a set of measures that must be taken into account in the design and development of measures so that any person, whether disabled or not, can make full use of a given environment, resource or service. Accessibility has ceased to be the application of some resources to alleviate the limitations that the environment poses to people with disabilities, to approach the concept of universal design, in which services, processes, environments, etc. are designed so that any person can use them as fully as possible. It is therefore essential to preserve the rights of all people.

Usability is the quality of an environment, process, object or service whereby it is easy for anyone to learn how to use and use it. This concept is closely related to the previous one, since we understand that if something meets the criteria of universal design it will also be easier and simpler to use for most of the population. Usability does not exclude the use of technical aids. Universal accessibility implies that objects, content or services can be used even with technical aids, as long as the result is simple and satisfactory, intuitive and easy to learn. But there is no point in making a service, device or application accessible if a complex and unintuitive path has to be followed to perform a given action or function.

Although each country has its own legislation, at the international level the most important standard is the “Convention on the rights of persons with disabilities”. This convention establishes that through universal accessibility, the participation of persons with disabilities must be guaranteed under equal conditions. Universal accessibility opens the door to a way of looking at reality that integrates various disciplines (social policies, architecture, urban planning, technological innovation). It is therefore a question of applying a different perspective from which we all benefit.

In the field of education, we find that the lack of technical and material resources that allow full access to academic training and the lack of limitation of professionals on inclusive training and available resources has been the main obstacle to the full educational development of visually impaired people. As for digitization, it has favored access to content widely, but the delay in the development of software and devices that allow access to scientific content, have been a major brake on access to training for students with visual impairment. While the rest of the students could follow an explanation of a scientific nature through the traditional or digital blackboard, or on their computers, students with visual impairment had to follow these studies with

Braille adaptations that are much slower in processing information. Fortunately this is changing rapidly.

However, the lack of information of teachers and their lack of training regarding inclusive educational procedures as well as the resources that the visually impaired student can count on to fully access scientific education, are an important obstacle.

Universal accessibility is a right of people with disabilities as stated in the United Nations Convention.
Universal accessibility implies that services, goods, contents and processes are easy to learn and use for any person, even if this requires the use of other devices.
In the field of education, the lack of knowledge of professionals about the resources that make teaching inclusive as well as the tools that make content accessible to students is the main problem.

3.3. Technical resources for people with blindness and low vision

There are multiple resources for people with blindness and low vision. We will initially divide these resources into those that are primarily used by people with low vision and those that are targeted to people with blindness. Some of these resources, such as screen reviewers, are shared by both population groups, we can say that they are not mutually exclusive. Finally, we will talk about methodological resources or access to information that are related to didactic procedures and their way of bringing training closer to all students.

- Optical aids: we are talking about magnifying glasses of all kinds, special glasses for reading, telescopes for distance vision, filters to adjust and regulate the lighting that reaches the eye, etc.. These are resources that require learning to use, since new reading skills are brought into play, different from those used by people without visual impairment. As a general rule, these resources allow the student to access any printed information, so that it is not necessary to expand or transcribe the information, but the student has his own means to access textbooks, notes, etc.. Reading, as with Braille, is slower and the person tends to get more tired, requires more effort, so their work time is shorter. They are aids that can be used in combination with other digital or auditory resources.
- Non-optical aids: these are all those resources that facilitate reading and writing for the student, such as lecterns that bring the text or document closer, pens or markers with a thicker tip, lined paper or paper of a certain color to favor contrast, lighting appropriate to the needs of the person. In general, it is valid to consider in this group any resource that improves contrast, reduces fatigue, improves lighting or favors a more comfortable body posture, thus allowing an easier and more efficient reading. In this sense, within the classroom it is essential to take into account the position and type of light, or the proximity to the blackboard.
- Electronic aids: these are devices that allow to electronically enlarge the image (depending on the device it can reach magnifications of 60 times the real size), apply different contrasts that favor reading, control color and lighting. They can be used for both near and far tasks such as viewing the whiteboard. There are also portable or desktop devices, to be used in a study or work station. The more portable devices are called electronic magnifiers, while the others are called TV magnifiers. There is a wide range of these devices.

- Screen magnifier: there are some programs that facilitate the digital enlargement of the screen without loss of image quality, with added functions such as customization of contrast, adaptation of color and size of the mouse, reading with voice or localization of the focus. Zoomtext, Magic, Zoom for macOS and IOS, Windows Magnifier, are some of the available magnifiers.
- Macro-character keyboard: a modification of the conventional keyboard with larger keys, colors and contrasts suitable for a visually



impaired person.

Resources for people with partial or total blindness.

- Notepad: already mentioned above, they allow to edit texts and save them in files, connect them to other devices. They have a braille keyboard which makes their size smaller.
- Braille lines: like the previous ones, they were mentioned in the preceding section, allowing the output of information from the device to which it is connected. It is a device that has a perforated strip through which the stems that make up the braille letters appear. Some incorporate a braille keyboard from which you can write and operate the device to which it is connected.
- Braille printer: they print on braille paper with a 6 or 8-dot code, have a spoken interface, and print documents from a computer, cell phone or notepad. There are models of a size that allows portability.



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- Screen reader: also called screen reader, it transmits to the user the information on the screen through the speech synthesizer or the braille line. Some of the most widely used are NVDA, Jaws, Narrator or Voiceover. There are also screen readers for mobile devices such as Talkback or voice Assistant.
- Optical character recognizer: this software allows access to printed text, by transforming it into digital with a scanner, being able to read the information through other devices (computer, mobile) and their adaptations.
- Text-to-speech converter: there are several programs that, based on speech synthesis, transform texts into synthetic voice files. Audiotesti, Balabolka, Dspeech, Lectotext.
- Daisy player: it can be hardware or software and reproduces audio contents and allows to go to chapters, pages, specific paragraphs or marks set by the user, allowing a smoother navigation through the spoken text. Currently the library of audiobooks is very extensive, being a great advance for access to culture and training for people with visual impairment or blindness.
- Voice assistants: voice assistants for mobile devices, but also for computers, are becoming increasingly popular. Siri, Alexa or Google voice assistant are the best known and most used. They are useful for entering texts but also for carrying out functions such as opening applications, making calls or obtaining information of various kinds.

There are specific resources for people with low vision such as optical and non-optical aids, electronic aids and magnifiers.
People with total or partial blindness use notepads, braille lines, screen readers, braille printers or optical character recognizers.
Some tools can be used regardless of whether or not you have any degree of vision, such as screen readers, text-to-speech recognition, Daisy player or voice assistants.

3.3.1. Adaptation of optical, electronic and digital resources to scientific subjects

As we have seen in the previous sections, there is currently an important variety of resources that in many cases are not mutually exclusive, but possibly complementary. Everything will depend on the visual characteristics and skills of the user and the activity for which they are used. There are tools that are more suitable for some people or others depending on their visual condition, and resources that are more suitable for specific activities. For example, some people will use optical aids for reading textbooks, but in the case of very long readings they can use audio files of the document or electronic aids such as the TV magnifier, which make reading more comfortable. This last resource can be more useful to see and explore a plan or a graphic than a close-up glasses or an optical magnifying glass because of its versatility and magnification capacity.

A visually impaired student can use a telescope or a TV magnifying glass to see the blackboard and follow the teacher's explanations, while a student with blindness will need the teacher to read aloud everything that is written on the blackboard and, if necessary, to provide this information in an accessible format so that the student can access it with his own resources. The latter can happen when we talk about mathematical or scientific developments, formulas or graphs. Having foresight of the contents to be

taught and the materials or resources that the student with visual impairment or blindness will require is an unavoidable requirement.

That is why it is important first of all to carry out an analysis of the student's characteristics and visual situation, his or her skills in the use of resources and the characteristics of the activities to be carried out. When we talk about scientific studies, blind or severely visually impaired students have had difficulties in accessing these contents because their adaptation involves the transcription into Braille of equations, formulas, scientific signs, etc. that make the study process and its comprehension slower and more difficult. In addition, these subjects include graphics, representations and images that are very difficult to access for a person with blindness or low vision. Some resources such as relief drawing tools, models, relief plans or images generated with Braille dots are useful, but insufficient. Moreover, most software relies on graphical interfaces, which is an insurmountable difficulty for people with severe visual impairment and blindness. Nowadays, there are already editors that make the study of these subjects more accessible. We are talking about the scientific-mathematical editor and the music editor. Both allow communication between sighted and blind people, facilitating teacher-student communication.

-
- Accessible scientific-mathematical editor has been designed to be used with Braille lines and speech synthesis. It includes specific tools of great didactic interest, favoring the work of students with blindness in scientific tasks (mathematics, chemistry,...).
- Music Editor: Software that allows to write music in the Braille system and listen to it later through the sound card.

It is essential for teachers to be aware of the existence of resources that allow access to scientific knowledge and, if necessary, training to make better



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use of these resources. They usually have the advice of professionals specialized in visual impairment who will provide them with the resources and training they need.

It is essential to adapt the technical aids to the visual characteristics of the student and to the activities for which they are used.

The scientific-mathematical editor allows accessible communication between teachers and students with blindness, and is a fundamental aid.

Teacher training, support from specialist teachers and instructional planning are key to inclusive teaching.



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UNIT 4. METHODOLOGICAL CONSIDERATIONS IN EDUCATIONAL AND TRAINING ATTENTION

CONTENT:

- 4.1. Basic visual and auditory perceptions and attention skills
- 4.2. Sensory Stimulation
- 4.3. Visual, tactile, and haptic memory
- 4.4. Communicative interaction strategies
- 4.5. Educational and professional implications of visual impairment

UNIT OBJECTIVES

The goal of this unit is to understand methodological considerations in educational and training according to needs of people with visual impairments in the educational environment.

The main objectives of this unit are:

- To learn perceptions and skills of visual impairment students
- To have information about communication strategies according to their needs,

at the same time to understand their educational and professional implications.

Introduction



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Almost all learning happens through the senses of sight and hearing. Therefore, loss of visual function as a result of damage to the visual organ affects learning. It is estimated that 85% of the information of the sighted person is through seeing. However, this does not mean that the visually impaired will obtain 85% less information than the sighted ones, it means that the visually impaired uses other sensory organs to obtain information.

The visually impaired obtains information using their mouth, tongue, ear, nose, and hands. Visually impaired people develop their feelings and thoughts about beauty, nature and others through their hearing, smell, and touch senses.

With the changes made in the teaching processes, the visually impaired child is prepared to continue his life independently with knowledge, skills and by using the power of touch, hearing, smell, and residual vision. In the classroom, when a child with complete or partial loss of visual function is recognized early and is referred to a health facility, vision can be restored. The child whose vision is corrected learns like other children. In addition, with the arrangement made in the teaching process, such as in-class arrangements such as putting those whose visual impairment cannot be corrected forward and making visual lesson activities into auditory and tactile activities, the other sensory organs are stimulated, and the groundwork is prepared for their learning. Thus, the visually impaired child can go to the school in the region where he / she lives and by realizing the aims of the lessons in his / her class, he / she is better prepared for the society he / she lives in and it will be easier to integrate with the society.

4.1. Basic Visual and Auditory Perceptions and Attention Skills

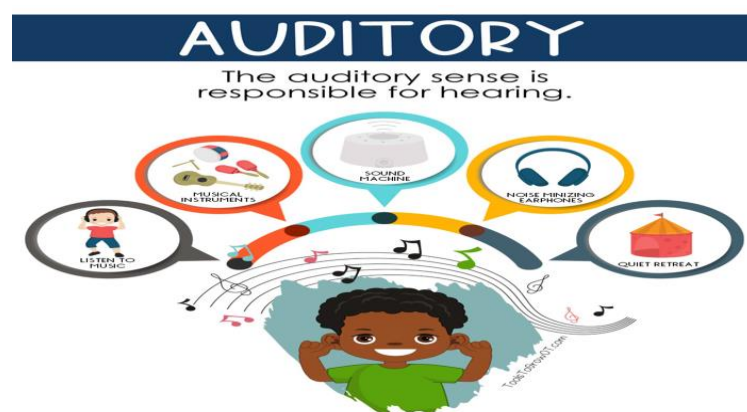


Image Description: There is a boy, he is showing his hear. There are 5 images which are showing auditory sources. And there is a sentence. The auditory sense is responsible for hearing

Educationally visual impaired is someone who needs tactile and auditory materials in education. This definition is to bring to mind reading first. The individual who is defined as educationally visual impaired, needs Braille or talking books for reading. It cannot use the sense of sight for learning. It is a person who sees low in educational terms and can use his / her sense of vision for learning. Individuals with low vision need tools such as glasses, magnifying glasses, materials such as large print, lighting, contrast, and environmental arrangements in order to use their vision potential at the highest level.

It is estimated that 85% of the information people receive from the outside world is through vision. However, this does not mean that visually impaired children will receive 85% less information than the sighted ones. It means that visually impaired children will also use other sensory organs to obtain information.

Young children perceive the world in an integrated way with their eyesight. The sense of sight also provides information to the child about objects and people outside of his immediate surroundings. In the absence of vision, the individual has to rely on his own studies and other people's expressions to learn about the world. Many objects in the environment are too large or too small and too abstract for the little child to be able to examine by touch and hearing. Verbal definitions depend on the point of view of the person making the definition and are incomplete. For this reason, visually impaired children cannot fully understand the events and objects in the environment.

Their conceptual development is slower than normal children. Especially in abstract concepts, success is low. The reason for this is the lack of suitable learning experiences.

Children with vision problems may experience problems such as looking at the same point for a long time, not being able to notice an object that might be of interest, not being able to follow the object with their eyes, not being able to distinguish colours, hitting objects frequently, falling frequently or reaching to the right and left aimlessly.

The subject that visually impaired children suffer the most is the concept. Because he tries to learn by using his other senses and his other senses are limited in the information about the field.

Many motor skills such as holding, releasing, eating, and dressing are learned as a result of adults's observation and imitation. Children affected by visual impairment have difficulty in observing and imitating adults.

There is no eye-hand coordination in visually impaired children due to their disability. He should mainly try to improve ear-to-hand cooperation in his training.

Cognitive development requires the use of the senses. Because everything in the mind is first perceived through the senses. It internalizes and stores it as a model that corresponds to the environment a child touches, hears, sees, tastes and smells. The lack



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of vision in visually impaired children causes them to be deprived of most of the information. For this, the use of their sense of touch is more active.

The concept, abstraction and classification development of visually impaired children always lags behind their peers.

Visually impaired children cannot make eye contact, cannot express themselves with gestures and mimics. It doesn't have strategies to get the attention of adults. For this reason, he may have tantrums and be cranky. When he discovers that he can draw the attention of the environment to this path, he may choose to cry and whine instead of verbal communication.

Language is a learned feature. There is almost no negative effect on the language development of those who have visual impairment due to auditory impairment.

A feature called echolalia (meaningless repetition of words) is observed in the speech of visually impaired children who are just beginning to speak. The reason for this is that the child is exposed to language experiences that do not mean communication. There is audio input in the middle, but since there is no meaningful audio input, they make meaningless word repetitions. They are interested in social activities. Their ability to act independently is limited.

There are many clues to spotting visually impaired children:

- **Inability to follow or notice interesting items in front of their eyes**
- **Don't look at the same place for a long time**
- **Turning your eyes in a different way**
- **Frequently rubbing and scratching your eyes**
- **Avoid light and eye trembling**

- **Aimless reaching left and right and falling frequently**
- **Inability to distinguish the colours of a coloured picture**
- **Redness and tears in the eyes**
- **Blur in the middle of your eyes and glare when light comes on**

Why does a child with visual impairment face learning difficulties?

If the child with low vision cannot see at all, they may have difficulties learning how to use their body. This difficulty is due to the inability to see how other people are moving their bodies while doing certain things.

The awareness of a child with visual impairment is different from the awareness of the environment. For this reason, new methods should be included in order for the visually impaired child to be aware of his / her environment. He is expected to become aware of his surroundings by hearing, touching, and smelling instead of seeing his surroundings. The visually impaired child begins to recognize his surroundings by touching.

The person makes significant use of sounds in making sense of his / her environment and his / her relationship with the environment. Sound is a form of energy caused by vibrations. Surrounding objects make sounds or reflect sounds. The vibrations travel through the air, leaving the source that makes the sound. The visually impaired person can design what kind of environment he / she is in through the sounds and echoes of the surrounding objects.

Identifying the Sound Source

It is extremely important for the visually impaired child to be able to identify where the sound comes from and its source. It is also referred to as "hearing in both ears"



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to determine the source of the sound. For example, when a coin falls out of your pocket, you can guess without seeing where the coin fell.

If the money falls near your left side, the loudness of the sound it makes tells you approximately where the money is. How can you guess where the money fell? As the sound waves from falling money spread around, they gradually weaken and eventually disappear. Since the money falls on the left side, the sound waves that the money makes come to your left ear first. When the sound waves reach your right ear, they become slightly weaker. From here we know that the money falls on our left. From the loudness of the sound, we can estimate how far it is. When one of our ears does not hear or when we cover our ears, it becomes harder to find money. It is extremely important to be able to determine the sound source and at what distance the sound source is, to determine the position of the visually impaired and to move independently.

Pinpointing by Reverberation

Finding a place with the resonance of the sound is possible with the sounds produced by the person hitting objects and coming back. The echo of the snapping sound changes as you get closer to the wall. Small changes in the resounding sound indicate that the wall is approaching or moving away. If you shouted in the valley, what you hear there is an echo of your voice. Make a sound by snapping your finger in a narrow hallway. Stand away from the wall at the end of the hallway and listen to the echo of the sound of your snapping finger. Get a little closer to the wall and keep snapping your finger. You will notice that the sound and its echo change. A visually impaired child who has learned to listen to the echo of the sound can always walk the same distance from the wall, with the echo of the sound of the snapping coming from the wall of the gym by clicking his finger. If this skill is not acquired at a young age, it is very difficult to learn.



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Object Perception

Do visually impaired people have the sixth sense? For centuries, people born with low vision have been thought to hear better than sighted people. These people were generally believed to have sixth senses called "seeing with their faces." The source of this belief is that some visually impaired people can wander around without hitting the things around them.

The belief that people with low vision hear better and have a sixth sense is unrealistic. It has been proven many years ago to be unreal. Visually impaired people who can sense objects do not have better hearing than the average sighted person. Hearing trials on both groups have proven this. When a visually impaired person notices an obstacle in front of him, it is because he knows what to listen to.

Sound Shadows

We all know how shadows are created by the sun. If we turn west one afternoon, our body blocks the sun's rays and a shadow forms behind us. The same thing happens with sounds.

Sniffing

The sense of smell is of particular importance during autonomous entanglement. There are always many odours in the environment that can tell exactly where a visually impaired person is. A pharmacy medicine, doctor's office antiseptic, a restaurant food smells; and a pastry oven smells good. The scent emanates from here tells the children exactly where they are. In roasted shops, coffee acts as a complete scent marker for location. If the visually impaired are not taught to distinguish similar smells, they will not be able to make use of these clues.

4.2. Sensory Stimulation

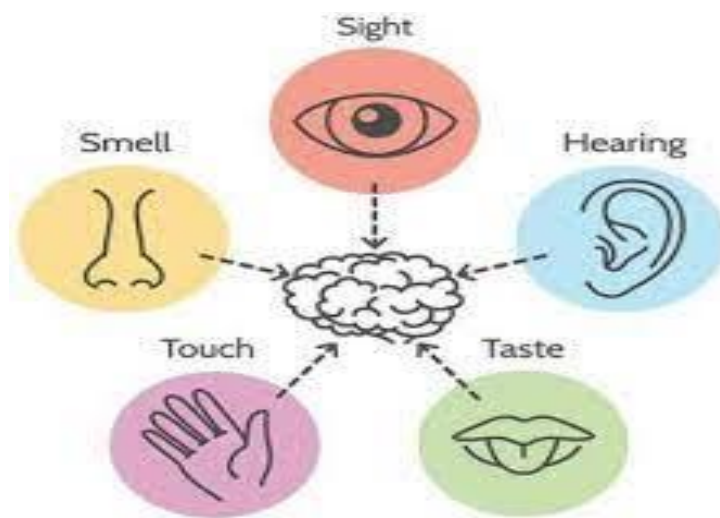


Image Description: There are 5 sense organs. Eye, ear, nose, hand, and tongue.

Visually impaired students, along with other sensory impaired students, often misperceive information or seek additional sensory stimuli to focus or calm themselves. Poor sensory processing can make it difficult for a student to perform functional and academic tasks.

Students' behaviour can provide clues to sensory processing problems. Students can react too much (hyper) or too little (hypo) to a variety of sensations. The aim is to provide an environment that helps the student to be better at interpreting and organizing sensory information. The first step is to determine the type of sensory



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information the student is looking for. Generally, students who react too little need a stimulation program, while those who react too much to stimuli need a calming environment.

Tactile Stimulation

Tactile is information received by touch, including sensitivity to light touch, pressure, pain, and temperature. Activities that involve a firm and constant touch help soothe and calm students, while activities that involve light and quick touching to body parts are more stimulating. Many students may resist getting their hands dirty or touching various materials.

Encourage gradual exposure to diverse textures and complex experiences in order to extend the variety and experience of the student to touch and explore. Other students may look lethargic or want to touch everything. To stimulate the child, perform stimulating activities for the student, such as tickling their arms or back and neck. Encourage the student to wash and dry the face to help stimulate it.

Possible activities to assist the student seeking tactile stimulation include turning the hair, stroking the fingers, rubbing various fabrics, wiggling toys to stretch, hugging, playing with textures (sand, rice, beans, shaving cream, finger paint, pudding), whipped cream, play -doh, clay, therapy, or goop) or hiding objects in tissues, doing hand massages, or holding vibrating toys or massages.

Proprioceptive (Inner perception / Self-sense) Stimulation

The proprioceptive is information about the relative positions of parts of the body. This information comes from sensations arising in the muscles, joints, ligaments, and receptors associated with the bones. Consider giving the student a medium to heavy backpack to wear while walking.



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Possible activities to assist the student seeking proprioceptive stimulation include hugging duvets, sitting on a beanbag chair, breaking the knuckles, crossing the legs, sitting on the legs, heavy workload activities, pushing, pulling, pulling, pushing against the wall and monkey sticks, a Do "power walk", wheelbarrow walk, crawl, or climb, or push-ups on the wall. Consider placing a beanbag chair in a quiet place for student use.

Visual Stimulation

Visual is information received from the eyes. Bland or monotonous visual input tends to be calming. Students seeking a tranquil environment can benefit from dimming the lights or working in a booth or well-kept area. Visual input that is bright and high in contrast or reflective tends to be warning. These students may prefer video games, neon colours, and fluorescent lights.

Possible activities to assist the student seeking visual stimulation include looking at painted nails and rings; browse through magazines, watch fish in an aquarium; Watch the "oil and water" toys. Minimize visual clutter as they can visually distract and cause clutter.

Gustatory Stimulation

Gustatory is information received through the tongue / lips. It is closely linked to his sense of smell. Possible activities to help the student seeking sweetening input are chewing flavoured toothpicks, sucking sugar (stimulating sour), chewing gum, drinking milkshakes, cracking, or sucking ice chips, chewing coffee swizzle sticks, taking slow deep breaths. The student can also be encouraged to suck, swallow, and breathe in coordination for self-regulation, calming, and focus.

Auditory Stimulation



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Auditory is information received from the ears. Rhythmic, soft, and fixed sounds are soothing. Loud and changeable voices are stimulating. For a student who is easily distracted by loud voices, use soft and calm speech to focus the student's attention. Play soft music in the background to calm the student or let them wear ear protectors or earmuffs to cushion noise.

Possible activities to assist the student seeking auditory stimulation include the hum of a humidifier, the soft hum or whistle of a ventilator, tapping a pencil on a surface, playing background music or music on an iPod or other music recording device. Consider placing a plush area rug or soft carpet in a quiet area of the room where the student can relax.

4.3. Visual, Tactile and Haptic Memory

Making Use of Residual Vision

Most of the visually impaired children have enough residual vision to read the text. Because of the difficulties encountered in reading with relief letters and the visual impairment increases the adaptation to learning and environment, the remnant of sight is used.

In the past, it was believed that using sight residue would cause more eye damage. "Keeping the book close to the eyes harms the eye, and therefore the sight." "Using the eyes for a long time harms the eyes." "Reading and using the eyesight of those who wear glasses with strong lenses harm the eye." Today, these beliefs have been found to be wrong. According to the legal definition, children who were defined as visually impaired were forced to read bibliographic material with their fingers for fear that their vision would deteriorate when they used their vision. Reading the text written in the Latin alphabet with the eyes is easier and faster than the text written in Braille (braille) with the touch.

Since the use of sight does not harm the eye and is easy and fast to read with the eyes, the visual impairment should be supported by enlarging the font size of the texts with the use of photocopying tools or using magnifiers, as well as adjusting the contrast between the text and the ground.

The visually impaired child's awareness of his environment differs from the awareness of the people around him. For this reason, it is necessary to include new methods for the visually impaired child to be aware of his environment. The visually impaired child is expected to become aware of his surroundings by hearing, touching, and smelling, instead of seeing his surroundings.

Learning Environment and Objects by Touch

Muscle sensation and haptic sensation are used to learn the environment and objects by touch.

Muscle Sense (Kinesthetics Sensation): The sense of touch provides little information other than heat, the texture of the object, and the shape of small objects. However, the visually impaired learn about their surroundings and other people through the sense of touch. Apart from objects with very small dimensions, the spatial relations of objects such as size, distance and ratio are perceived by using touch and muscle sensation together.



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When we take a bucket off the ground and look at its weight, we use our muscle sense. While eating the food, bringing the spoon to our mouth, we take advantage of our muscle memory.

Tying the shoelace is another example of the use of "muscle memory". When tying shoelaces, not every small step of tying shoelace is considered. Thanks to the muscle sensation, shoe binding becomes a skill. Movement is noticed by muscle sensation or / and this movement is kept in memory. This sensation tells us what the muscles are doing. Visually impaired people use their muscle memory to predict when they will turn, climb the ladder, or walk while moving. The more the visually impaired child is given the chance to use their fingers, hands, arms and feet, the more muscle sensation develops. Without "muscle memory" it is impossible to know how far there is from the front door to the sidewalk, from the classroom to the end of the hallway, from the bed to the toilet.

Haptic Sense: A visually impaired child is incapable of creating a visual image (dream) of an object, as a sighted child does. A seeing person can close their eyes and, with the help of their visual memory, remember what a table looks like. A visually impaired child can also keep what a table looks like in his memory. But he uses the haptic image (imaginary). The visually impaired child's image of the table is based on a combination of touch, feeling, and body movements. We call this "haptic sensation".

By bringing together all the tactile and kinesthetics impressions of the table, the congenital visually impaired child can form a haptic concept of the table, similar to the way a sighted child imagines a table. For someone with congenital visual impairment, it is displayed not as a table image but in its texture, density, and tactile form. The person with visual impairment improves his memory with the sensations he obtains by examining the object at different times by using the sense of touching the object repeatedly. It then combines these sensations to create a haptic image. Haptic sensation involves touching the object inch by inch, or step by step, to examine it. The visually impaired creates the concept of the object by touching the object and examining it in detail. The person who sees realizes the concept of the object by scanning his / her eye.



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The visually impaired cannot fully comprehend a visual image, and those who see it have difficulty understanding a haptic image created by a congenital visually impaired person.

The visually impaired child must use his haptic sensation in order to organize and understand his world. He must feel everything with his fingertips.

- The visually impaired child should be able to recognize all the things in the classroom by feeling them with his hands. While promoting the items, their real names should be introduced.
- Time should be given to the child to feel with his fingertips in order to develop his sense of touch. For example, small buttons are mixed after chickpeas and lentils are shown to him, and then the child is asked to separate them by touching them with their fingertips.
- He should be given the opportunity to examine those around him.
- The child should be given objects that he can hold. Meanwhile, it should be explained what the object is holding, what it looks like and how it is used.
- The features of these items should be explained in detail so that the child can recognize

the items around him well.

4.4. Communicative Interaction Strategy

Communication Skills Visually impaired students gain the information about their surroundings and their lessons by touching, as in bibliography, as well as by listening to this information to a great extent. The development of listening skills starts from infancy. The visually impaired child makes sense of his environment by listening to the sounds that occur in the environment. In school age, listening sometimes replaces acquiring information through touch and the residue of sight. Due to the fact that listening has increased the quality of the learning of the visually impaired, regulations in which listening is predominant have started to be included in the teaching processes. The number of books read on cassettes has increased. These talking books are used in the lessons. Reading speed is low with braille and enlarged letters. Speaking books are frequently used to overcome this limitation in reading. It is a necessity to develop the listening skills of visually impaired children and to make the most of these skills.

The following suggestions can be taken into consideration for a visually impaired child to listen and understand his environment.

- When talking to a visually impaired child in the classroom, if you say his name, he can understand that he is being talked to.
- Instead of expressing what you want from a visually impaired child in the classroom with sentences based on seeing it as "give me this, here it is", you can use sentences such as "find the cube next to the right foot", "standing in the upper right corner of the table" you help him find objects in the way.
- Use your voice in different ways when the child needs to be attentive, in danger, and when you are happy. The child will be able to distinguish these situations by paying attention to your tone of voice in the future.



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- Speaking of a child who is completely blind may not be stimulated due to the lack of visual experiences. If the object is not visible, there may be no need to name it and ask for it. Therefore, the child can be warned by describing what is happening around him.
- Visually impaired children should not be prevented from using words such as "I can see", "see" and "appearance" while touching, as they lead their lives among those who see it. Even if he cannot see it, it is okay to learn the names of colours, that the grass is green, and the sky is blue.
- All children love to be told stories. These kinds of activities will not only please the visually impaired child, but also contribute to the development of their language. If the child does not understand the story and asks you questions, explain patiently and answer their questions without getting angry. Describe the pictures and figures to the child.
- Help him find where the sounds in the environment come from, by using his touch or his residual vision.

Suggestions to the teacher

- With family visits by teachers, you will help them to accept their children by saying that you are especially interested in the visually impaired child and by accepting them.
- The blind child can be helped medically, environmentally, and educationally.



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- As part of the efforts to develop a sense of independence in visually impaired children, these children should be asked to be responsible for their own educational books and tools.
- The sighted child in the classroom can guide the child who is visually impaired from time to time. However, care should be taken that the child with visual impairment does not become too dependent.
- Children with Visual Impairment should be encouraged to participate in every activity in the classroom. If it is not possible for them to participate in classroom activities, additional activities should be organized.
- It is always beneficial for the visually impaired child if the teacher says aloud what he / she writes / draws while writing / drawing on the board.
- In addition to the problems seen in mathematics teaching, additional regulations may be needed because science and geography are based on too many visual stimuli.

Therefore, materials and information should be obtained from visually impaired schools.

- It may be appropriate to give additional time for the visually impaired child to complete his / her homework.
- Social relationships between sighted and visually impaired children should be encouraged.
- The student with low vision should be seated in the front rows, and the appropriate size objects should be prepared for the light coming from behind.

4.5. Educational and Vocational Integration of Visually Impaired Individuals

BLACK: <https://youtu.be/97joWcX1w7Q> this link is a film suggestion about this subject.

It differs according to the degree of disability. The earlier the child's educational activities are started, the higher the result will be. Regardless of the degree of visual impairment, these children have the need and right to learn to read and write and



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to act independently in their environment. Arrangements should be made in the following areas in the education program of visually impaired children.

- **Reading - writing, listening**
- **Utilizing visual residue**
- **Orientation and independent movement training**
- **Daily life skills and social skills**

Students who use the sense of touch primarily for learning from visually impaired students learn with the Braille alphabet.

This alphabet is an alphabet system consisting of letters, numbers, punctuation marks, mathematical signs, musical notes with various combinations of six dots in two columns.

Educational Implications of Visual Impairment

Students with visual impairments sometimes have fewer natural learning experiences because they are not able to observe objects and interactions. The areas of learning which are particularly affected are: concept development; interpersonal communication skills; life skills; orientation and mobility skills; and academic development.

Development of concepts is the basis of all learning. Spatial relationships, time, body awareness and self-awareness are just a few examples of fundamental concepts individuals need to make sense of their world.

These concepts may need to be specifically taught to students with visual impairments. Although the main focus will be on academic development, providing a variety of opportunities for personal development can have a profound impact on a student who is visually impaired. Encouraging a positive self-image, appropriate dress, well-developed self-care skills, good interpersonal communication, appropriate



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behaviours, increased independence, and productive community living can all be tremendously beneficial in the healthy growth of students with visual impairments.

As with all students, relationships are important for students with visual impairments and the classroom can be a wonderful place for development and maturity to flourish.

The development of a student with a visual impairment is affected by the type and severity of the visual impairment; the onset of the visual impairment; the nature and degree of intervention; the use of residual vision; personality; the availability of equipment and resources; the presence of other disabilities; family adjustment and acceptance; and cultural attitudes to visual impairment.

Career Education

Unemployment and underemployment of adults with low vision is a continuing concern. Career education is essential to the employability of adults with visual impairments. Students with low vision need to explore a wide variety of career options deliberately and directly. Career education curriculums that have been developed for sighted children may need supplementary instruction from a teacher who works with students with visual impairments. Career education at the exploration level for younger students could well mean many field trips into the community so that the student with low vision will have exposure to people and work situations. The student must develop a realistic understanding of his/her limitations and potential. Emphasize the following: self-awareness; strengths; weaknesses; interests/abilities; values; goals; prevocational skills; career awareness; career exploration; job preparation; interview skills; resume writing; application forms; job seeking skills; awareness of sources of funding e.g., Employment Assistance for Disabled Persons (EADP); awareness that many post-secondary institutions have support services for students with disabilities; and employment issues related to the visual impairment (informing potential employers, adaptations in the workplace).



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Policy Within Higher Education

As far as institutions and departments are concerned, the relevant policy guidelines are those provided by the funding councils and the Quality Assurance Agency for Higher Education (QAA). In its Code of Practice on Assessment (QAA, 2000), it states very clearly that programme specifications should include no unnecessary barriers to access by disabled people. Its guidance includes the proposal that: Institutions should consider establishing procedures which ensure that:

- The setting and/or amendment of academic and other programme requirements during approval and validation processes includes well-informed consideration of the requirements of disabled students
- Programme specifications and descriptions give sufficient information to enable students with disabilities and staff to make informed decisions about the ability to complete the programme. The QAA's Code of Practice for the Assurance of Academic Quality and Standards for Students with Disabilities (QAA, 1999), which came into force in September 2000, is designed to assist institutions in ensuring that disabled students have access to a learning experience which is comparable with that of their non-disabled peers.

It contains 24 precepts against which institutions will be assessed and covers the student experience from pre-entry to exit. The Code makes clear its expectations in relation to fieldwork and study overseas in Precept 11: Institutions should ensure that, wherever possible, disabled students have access to academic and vocational placements including fieldtrips and study abroad. The Quality Assurance Agency (QAA) Code of Practice: Students with Disabilities (QAA, 1999) asks institutions to: Consider making arrangements which ensure that all academic and technical staff:

- plan and employ teaching and learning strategies which make the delivery of the programme as inclusive as is reasonably possible;



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- know and understand the learning implications of any disabilities of the students whom they teach and are responsive to student feedback; and
- make individual adaptations to delivery that are appropriate for particular students, which might include providing handouts in advance and/or in different formats (Braille, disk), short breaks for interpreters to rest, or using radio microphone systems, or flexible/interrupted study for students with mental health

Issues for The Future

The Special Educational Needs and Disability Act (SENDA) is likely to have a much greater impact on higher education than the DDA. The new Act, passed in 2001, identifies two significant policy imperatives for higher education institutions:

- a duty not to treat disabled pupils and students less favourably, without justification, than non-disabled pupils and students
- a duty to make reasonable adjustments to enable disabled students to have full access to higher education.

The advocacy of making ‘reasonable adjustments’, which would prevent disabled students from being placed at substantial disadvantage in comparison to students who are not disabled, will need to be considered very carefully by departments planning field courses.

These ‘reasonable adjustments’, which may be made to admissions procedures, course content, placements, teaching arrangements, provision of information and examinations, bring to the fore significant questions relating to the maintenance of educational standards and the assurance of equal opportunities in and out of the classroom.



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UNIT 5 CLASS MANAGEMENT TO INCLUDE STUDENTS WITH VISUAL IMPAIRMENTS

INTRODUCTION

5.1 MANAGEMENT GUIDELINES

5.1.2 INDIVIDUALS WITH VISUAL IMPAIRMENTS

5.1.3 MANAGEMENT GUIDELINES TO INCLUDE STUDENTS WITH VISUAL IMPAIRMENTS

5.2 ADAPTED ACTIVITIES

UNIT OBJECTIVES

The goal of this unit is to acquaint us with understanding, integrating, and managing the needs of students with visual impairments in an educational environment.

Its main learning objectives are:

- To clarify the situation of these students, the difficulties they face and the general principles for their integration in the educational process.
- To provide professionals some adapted activities and the way to apply them in order to integrate these individuals.



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INTRODUCTION

There are multiple ways to define impairment and describe people with it. Each of its possible definitions depends on the perspective and the purpose for which it is attempted. For example, we define disability in a different way from a medical point of view while in a different way from a professional point of view.

Possible criteria on an impairment definition are:

- The social rules and the form of society.
- The type of disability and the scientific perspective on which we approach it.
- The social or occupational disadvantages.

The WHO definition of impairment is summarized below:

"Impairment is defined as a complex and changing phenomenon, due to the interaction of a person's personal characteristics and the characteristics of the environment in which he lives. It is the result of organic or environmental causes, which create a set of obstacles and constraints in important areas of life, such as self-care, employment, education, entertainment and general social participation. "

Possible criteria for defining impairment are the social rules, the type of impairment from a scientific point of view and its social or occupational disadvantages.
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5.1 MANAGEMENT GUIDELINES

5.1.1 INDIVIDUALS WITH VISUAL IMPAIRMENTS

There are many reasons that lead to visual impairment. The reasons are related to problems before, during or even after the birth of the person, diseases, accidents, and other causes.

There are also many levels and kinds of visual impairment:

- There are people with partial or total blindness, with partial or total visual focus problems.
- There are also people who are in the process of healing or improving their eyesight, as well as people whose ability to see decreases over time.
- Finally, there are people who also have other problems except a visual impairment, related or not to the ability to perceive the environment.

In summary, we could mention that the variety of visual impairments leads to a variety of the individual's ability to participate or to adapt and to a variety of the methods to facilitate this adaptation.

There are many types and forms of visual impairment and specific difficulties in the process of integration into the school and wider environment.

5.1.2 MANAGEMENT GUIDELINES TO INCLUDE STUDENTS WITH VISUAL IMPAIRMENTS

Each case of visual impairment is different and with different characteristics. However, there are some common rules and management guidelines for their inclusion.

These guidelines address three key issues:

- Equipment of all kinds and technical and practical support.
- Teaching methods and interaction with educational material.



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- The individual's position in the community, dealing with the disadvantages and his/ her role in the group.

In terms of equipment and technical support, the goal is to provide the student with visual impairments all the necessary means in order to attend the class and participate in the educational process.

To achieve this goal, the following are useful:

- i. Encouraging and providing all the tools that the individual already uses in his / her daily life, to facilitate him / her during the educational process, depending on the type and level of his impairment.
- ii. The configuration of all the parts of the classroom in which he is located, in order to easily use them despite his impairment.
- iii. The proper selection of tools already used in the educational process, in such a way as to develop his / her skills and talents, avoiding a sense of disadvantage and exclusion.

Here is an example that could explain the above:

"When S. (a visually impaired student) went to this school, judging by the problems and loneliness he felt with the children in his neighborhood, he thought things would be very difficult. During the first days, he was quiet, closed to others and to the teacher. He thought he could not correspond to what others did. He thought he could not do the basics, attend class, read the board, watch movies and videos. He was afraid to enter the classroom, move in the corridors or use his cane, although he found out that there were railings and spacious corridors. As he could hardly see from distance, he believed that he could not cope with the difficulties and did not feel well no matter how much he found out that the teacher was trying to make his life easier."

In terms of the teaching methods and the interaction with the educational material, the aim is to use them in such a way that there are no difficulties or obstacles for such people.



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To achieve this goal, the following are useful:

- i. Avoiding methods or ways that make participation for the visually impaired difficult or impossible.
- ii. Utilizing all the tools so that these people can equally access the educational material or not be excluded from it.
- iii. The combination of methods and educational material in such a way as to ensure the development of the teacher's initiative, adaptability to the needs of these individuals and ultimately their smooth integration.
- iv. The personal relationship and interaction of the teacher and these students in order to ensure the continuous smooth participation and understanding during the educational process.

Continuing the previous example:

"In his classroom that had a small number of students, S. was placed by the teacher on the first desk, to have easy visual access and K. was placed with him. They soon discovered that they live close by, and that it was easy to move to school together, as well as to have discussions and common habits during their free time.

K. likes S.'s jokes a lot, he also helps him both during the lesson and after it, giving his notes and everything that S. does not manage to accomplish due to his impairment. At the same time, S., being a better student, explains and solves his friend's problems with the lessons.

Based on an idea they got from the class and at the instigation of their teacher, they like to watch movies together, and K. reads loud the subtitles, just as they do at school. This ability had also helped him a lot in the classroom, since he could take quickly notes or understand everything he could hear, despite his visual impairment.

The two of them are planning to organize their first school newspaper, since S., despite his difficulty in reading, is very good at writing texts and taking notes."

In terms of the individual's position in the community, dealing with disability and with his role in the group, the goal is:

- the development of the parity of these people with the rest of the trainees,
- their smooth integration and reception by the whole
- developing roles that these individuals can have based on their abilities.

To achieve this goal, the following are useful:



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- i. The preparation of the other trainees to welcome these people and to treat them as equals in their common activities.
- ii. Dealing with the sense of disadvantage that is often observed in these individuals and in their relationships with the whole.
- iii. The continuous encouragement and facilitation of these individuals to actively participate in activities outside the educational process.
- iv. The reminder of the equal position of these people among all students.
- v. The development of the personal relationship of individuals with the teacher, in order to ensure the solution of problems that arise during the process of integration into the educational community.
- vi. The development of the personal abilities of the individual and their promotion both during and after the educational process.

Concluding the example:

“Especially during the first time at school, S. considered that one of the courses that would be excluded from, was Gymnastics. While he was doing well and could do individual exercise, he believed that his disability would prevent him from that part of the lesson that the other children enjoyed most, team sports. He was determined that in the gym, he would ask for permission and go back to class, not to listen to the others and to study his lessons.

To his great surprise, he heard his teacher urge him to play table tennis in the gym, a sport he had not practiced before, although he could play.

A few months later, S. plays table tennis every time in the gym, asked his parents to practice at home, discovered the city ping pong team and there are many who, seeing how good he is, asked him to teach them as well as play together. S. (and the idea of his teacher) made table tennis famous at school. There are many more children who play table tennis in the gym and during breaks, while at their request, next month the first school tournament will be organized.

In addition, the teacher discovered that S. played the guitar in his spare time, since his parents are musicians. When the teacher invited him to the school orchestra, a new world opened in front of his eyes. Even if he was not able to read scores and being a visual impaired person, everyone enjoyed playing music with him or just listening to him. It was a surprise, when the teacher suggested him as the head of the orchestra, since he was the best and most musically educated among its members.

Now S., who, in both ways met children from other classes but also students who lived near his house, plays music and table tennis, with some of them outside school. His life has changed.”



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Management guidelines for the integration of people with visual impairments can be based on equipment and technical support, teaching methods and interaction with educational materials and the individual's position in the community, dealing with disability and the role in a group.

5.2 ADAPTED ACTIVITIES

Having seen the guidelines and general principles for including students with a visual impairment, here are some activities you can do to integrate them. Those activities are related to the topics we used above:

Related to the equipment and technical support:

1. Configure the classroom so that visually impaired students can move around. Spacious corridors, distinct placement of all furniture and appropriate general layout, so these individuals can move comfortably.
2. Encourage and help these students to use the facilities of the classroom (cupboards, shelves), as well as to get acquainted with the movement in the space, as your other students do.
3. Make sure to explain and encourage these students to use within the classroom all the tools they use in their daily lives (glasses, cane, attendant).
4. Ensure that every space used by these people outside the educational process (stairs, corridors) is properly designed and equipped, for comfortable movement without hesitation and risk.
5. Seek and consider the supply of special equipment, exclusively for the visually impaired, such as special computers.
6. In the case of people with total vision loss, make sure the educational material is accessible to them. Employ the conversion, acquisition and use of the educational material in an appropriate form (Braille touch systems).
7. Help these people to see. Place them at a suitable distance from you or the board, depending on their level of visual ability. The closer the distance depending on the occasion, the easier their participation will be.
8. Especially when using multimedia or the board, explain to these people that they can move to nearby or convenient places to facilitate their interaction with these media.



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9. The use of appropriate lighting facilitates reading from a distance. Take care of that. Ask these students if lighting prevents them from seeing and reading.
10. Consult, discuss and use, if necessary, specialist trainers for the visually impaired both in relation to equipment and in general.
11. If you also deem it necessary, consult a specialist educator for the visually impaired, for inclusion issues, inside and outside the educational process.
12. Finally, is good to reject in advance the use of educational material, the understanding of which is prohibitive for people with visual impairments. Small font sizes and generally illegible images should be avoided.

Related to the teaching methods and the interaction with the educational material:

1. Remember that the goal is to include these students in the whole educational process, from the opening to the closing, as well as during the exams.
2. Take care of all the details for their participation in the educational process, so that they do not feel excluded from it.
3. The way you and the students use their senses is important to these people. Emphasize to the use of voice and sound, degrade the role of remote reading.
4. In general, utilize and highlight the role of other senses, such as touch, hearing, and even smell, both for these individuals and for all students.
5. Other types and forms of educational process, interactive and non-interactive, such as theatrical play, may be useful to you.
6. Do not hesitate to give roles and responsibilities to these people and help cope with them, even if they think they cannot.
7. More specifically, give them the opportunity to participate or undertake presentations and activities to the class and other peers.
9. Encourage students' interaction. Organize small classes.
9. Read aloud or have another student read aloud everything that is written on the board or elsewhere in the classroom so that these people can copy or take notes.
10. For the same reasons, in the case of using multimedia combined with subtitles, they can be read aloud by another learner.
11. Be sure to give copies to these individuals, especially those with partial rather than total visual loss, from the notes on the board, from a map or from the presentation files used in the educational process.



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12. In general, help them become familiar with all the materials by giving them in advance (notes, map, table, multimedia).
13. When using images, make it easier to understand them by describing their details orally.
14. It is also a good idea to place a classmate near them so he can help to understand and explain what is happening during the learning process.
15. Give them the time they need to assimilate all the information available during the training process.
16. The development of individualized or supportive teaching methods for these individuals, along with the rest of it, may also prove useful.
17. Ask for help in turn. Talk to experienced instructors as well as collaborate with a qualified associate trainer if needed.
18. Do not hesitate to feel free in your role. The constant re-evaluation of the educational material and its re-modification based on the needs and the new data will definitely be necessary.

Related to the position in the community, the management of the disadvantage and the role in the group:

1. Remember that the most important need of these people is safety.
2. In addition, make sure they feel confident, both during and outside the lesson.
3. Do not forget that your role remains important for these people. It is good to earn their trust.
4. Discuss with them. Do not forget that it is often difficult to overcome the stereotypes they develop, related to the means that facilitate them, their presence in the classroom, and their participation during the course.
5. Also discuss with them in order to discover their abilities and talents.
6. Be constantly encouraging and supportive to them but also to all the trainees. Every child is unique and its particularities are respected.
7. Do not forget that treatment to these individuals must not cause a sense of privilege or disadvantage, but should be aimed at inclusion and parity.
8. Through your teaching methods, develop teamwork as a way of life.
9. Create working groups, role and responsibility groups, and activity groups.
10. Suggest extracurricular activities with the participation of these students.



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11. Emphasize activities based on the ability of these people to overcome their difficulties.
12. Also emphasize activities that highlight their talents and other skills.
13. Equip and inform the educational community itself with the holistic culture of inclusion and acceptance.
14. Use appropriate preparation and acceptance material intended for other students and staff.
15. Also develop methods related to inclusion, through discussion with members of the educational community.
16. The extracurricular environment often plays an important role in including or not these people, so it is a good idea to explore it. Possibly work with their family and environment to get a complete picture of these people.
17. As we said, you are important to these people. Probably in the context of a trustful and supportive relationship, it would be good to socialize with them, inside or outside the educational community.
18. Be vigilant. Diagnose in time possible potential mistreatment of these individuals by co-learners, family or the wider social environment.
19. Do not forget to take advantage of the help given to you. The smooth cooperation and coordination with all the parallel methods that are employed for these people (supportive, individualized teaching) but also with special trainers, helps in the feedback and the adaptability of your methods.

Applied techniques for the integration of people with visual disabilities can be shaped based on equipment and technical support, teaching methods and interaction with educational materials, the individual's position in the community, dealing with disability and the role in group.



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UNIT 6: Counselling and communicative skills

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to empathize with visually impaired individuals - 6.1.1 Emphaty

6.1.2 Activities

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OBJECTIVES

In this unit, general characteristics of visually impaired individuals will be learned. Healthy empathy techniques will be learned in order to communicate effectively with them.

It is intended to guide teachers and professionals advisors with integrated classrooms.

INTRODUCTION

Welcome to our counseling and communication training for visually impaired individuals. We perceive and recognize the outside world through our senses. As is



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known, the eye is one of the most important sensory organs. We can think of our eyes as a person's window to the outside. The lack of sense of vision affects human life very negatively. Because seeing is needed in order to continue life normally and to fulfill many tasks. Sighted children learn many concepts and skills necessary for daily life almost effortlessly by observing and imitating adults. However, if learning experiences are not provided to children with visual impairment, they cannot easily acquire many concepts and skills. It is the most natural right for individuals with disabilities to continue their lives without needing anyone in every field.

6.1 Techniques to be able to empathise with visually impaired individuals

Empathizing with visually impaired individuals allows us to understand them better and help them more accurately.

For this we need to get to know them better. General Characteristics of Visually Impaired Individuals;

1. Individuals with congenital visual impairment may show purposeless movements such as swinging forward or backward while standing or sitting, waving their fingers or hands in front of their face, waving their fingers or hand, rubbing their eyes with their fingers.

2. Visually impaired individuals have a passive and meaningless facial expression in their communication with them since they cannot portray people's faces and the appearance of things.

3. When talking to sighted individuals, they often seem insensitive and indifferent.



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4. Many studies reveal that visually impaired individuals have a delay in acquiring movement skills such as rolling and walking, which enable them to move.
5. Motor delay is not observed among individuals who subsequently lost their sense of vision, but motor delay is observed in individuals who have previously lost their sense of vision.
6. Individuals who are completely blind (total blind) show formal behaviors such as walking with a shorter step, a pronounced shifting behavior, slow walking, and inclined walking.
7. Delay in conceptual development or cognitive abilities may be observed.
8. They may be less successful in skills that require abstract thinking.
9. It is difficult to give the concept of field. Information about the field is gained mostly through the sense of touch.
10. They try to compensate for the deficiencies caused by visual impairment by using other sense organs.
11. Their ability to concentrate attention and notice fine details has improved.
12. They are interested in social activities.
13. They are interested in music.
14. There are differences in their physical and mental development.
15. Their ability to act independently is limited.
16. Delay in perceptual motor and cognitive development is observed.
17. They may have difficulty changing facial expression while communicating.

6.1.1 EMPATHY



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One of the most important features that distinguish humans from other living things is socialization and communication. Empathizing in our communication with others is an important element that strengthens communication. In this context, the contributions of empathy to human life can be listed as follows:

(Dökmen, 2005; Mozakoğlu, 2015; Önder, 2015; Ünal, 2007 and Türnüklü & Çetin, 2015):

- Empathy strengthens communication and provides social acceptance by reducing the self-centered thinking of the person.

- It ensures the continuation of the established communication and reinforces the feeling of helping.

- It provides a comfortable understanding of the emotional state of the other person. For this reason, it helps to establish deep communication by understanding other individuals in more detail.

- The basic element of being noticed, accepted and valued in interpersonal communication is empathy. Empathic communication strengthens the sense of uniqueness.

- It eliminates prejudices by removing the communication barriers.

- Gives tendencies such as problem and conflict solving, communication, listening, sensuality.

- It provides an environment of tolerance by transforming people's attitudes towards each other into a positive one.

- Increases the level of caring and allows to see the positive aspects of life.

- Provides the skills of helping each other, sharing and responsibility.



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- Provides understanding of differences within cultures, negative criticism obstacles.
- It reduces pressure and bullying.

The Place of Empathy in the Classroom Environment

Communicating individuals overcome many problems when they feel mutually understood and appreciated. Both sides will gain in empathically established communication. The person who empathizes will be selected among his peers and shown as an exemplary person. In addition, individuals who are empathetic in communication will be more loved individuals in the classroom environment. At the same time, individuals with high empathic communication skills are more preferred individuals.

Many factors are associated with empathy. There is a positive relationship between social acceptance, helpfulness, positive peer relationships and empathy.

Students with high empathy skills are more comfortable and able to express themselves better in the classroom. When we look at the individual recognition techniques applied in classrooms (sociometry, who is it, etc.), students with high empathic tendencies are those who are in the leader position and are preferred for communication. Goleman, Boyatzio, and Mckee (2002), in their research on leadership, are the people whose leaders say the most appropriate words that can be said in accordance with the emotions of the group they lead, and do the most appropriate behaviors; They emphasize the importance of empathy in a group environment.

One of the important factors that cause change and learning in a relationship is the skill of high level empathy (Rogers, 1983: 52-55). Empathy plays an inevitable role for the emergence and development of learning behavior in



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the classroom environment. Individuals who feel that they are not understood in the classroom environment and who think they do not see value will not be able to participate in learning activities and will not be able to show self-disclosure behavior in various situations.

The Importance of Empathy in Inclusive Student Applications

Students who need special needs for any reason are faced with many problems while performing education activities together with their peers in the normal development process with mainstream education.

The inadequacies experienced by students appear in many areas and cause a lack of displaying some emotions and behaviors in their daily lives. This deficiency sometimes occurs directly due to the obstacle they have, sometimes due to the classroom atmosphere and the attitudes of others, and sometimes due to deficiencies and errors in inclusive student programs. According to Batu and Iftar (2016), in order to be successful, students who do not have special needs need to accept inclusive students very well. (p: 30-36). Bell (1989) stated that successful integration depends on five elements: attitudes, skills, resources, organization and curriculum (cited in Mağden and Avcı, 1997: 275-296).

The transfer of knowledge and skills within the scope of educational activities in school environments is not gained only by student-teacher interaction. It is seen that the students acquired many knowledge and skills as a result of interacting with their peers. Interaction of inclusive students with their peers is a very important factor. For this reason, communication is very important in the classroom where mainstreaming students are present. It is a prerequisite for interaction and sharing for students with no special needs to acc



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ept students with special needs in
their classes and to have information about these students.

Teachers who attend classes in classes where inclusive education is applied are required to establish a double-sided empathy. The teacher should be able to comprehend what the students in the normal development process think and feel due to being in the same environment with the inclusive students. In addition, the teacher should be able to understand how students with special needs in the classroom are affected by the behavior and expressions of their normal peers. For this, the teacher should have an empathetic perspective. Studies show that there is an inverse relationship between empathy and bullying. One of the important factors that creates a communication barrier in the classroom and undermines the sense of belonging in the classroom is the low level of empathy (Rehber, 2007; Filiz 2009 and Güven 2015).

One of the biggest problems that inclusive students face in the classroom environment is the aggressive attitude of their peers in their normal development process. Filiz (2009) examined the relationship between secondary school students' empathic tendency levels and aggression and found that there is a negative relationship between empathic tendency and aggression scores (p: 99-100).

Sucuoğlu (2006) states that the teacher should ask himself/herself the following questions in



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order to increase learning and support development in
the classroom where inclusive students are present:

- Do I treat my special needs student as I treat others?
- Does my student feel belonging to this class?
- Is my student happy to be in my classroom, is he happy in my classroom?
- Were the teaching methods I used, the adaptations and arrangements I made effective for all students?
- Is my student confident and successful?
- Is my student learning? Is it improving?
- Does my student share positive experiences (friendship, working together, playing together, interacting, etc.) with peers in the classroom?
- Have the experiences I had due to the fact that my special needs student was in my classroom were satisfying / self-improving for me (p: 52)?

Schools host students from different sociocultural backgrounds in terms of their structures. These differences determine the social proximity of students to each other.

While there is such a difference in the classroom, problems may be observed in the acceptance of individuals with special needs. When normally developing students and students with special needs are found together in the classroom environment, different thinking styles, different academic achievements and different physical characteristics are observed among these students. In all this difference, the attitudes of students at normal developmental level towards their peers with special needs play a significant role in the success of inclusive education. Students in the normal development process should be able to understand the emotions,



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thoughts and feelings of
their special needs peers and help them achieve social cohesion and acceptance, which is the basis of inclusion. In order to do this, it is necessary to have an empathetic understanding in
the classroom and to have teachers and students with high empathic tendency.

Emotional and Social Development

Individuals communicate better with people than visually impaired individuals. Because gestures, and body movements are the elements that strengthen the communication between people. For example; like smile, frown and laughter. The relations of the visually impaired with the outside World provided through other sense organs. The failure of the eye to function can cause the child to be introverted and indifferent to his surroundings. Attitudes such as excessive protection, pity, exclusion and negligence shown by the parents and the people around them cause communication disorders in these children and make it difficult for these children to adapt to the social environment.

The fact that parents do not encourage their visual impaired children to play with sighted children causes these children to be introverted and withdrawn. In addition, this attitude of the parents may cause the child to not recognize his environment properly and to lack self-confidence in the child.

As the child with visual impairment approaches adulthood, adaptation problems may increase. Some children with visual impairment can adapt more easily and successfully than others.



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The immediate environment and the time of onset and development of the child's visual impairment are important in this. In addition, parents accept the child and support their children in any way is one of the factors that make it easier for children to adapt to the social environment.

Strabismus is one of the most common vision problems. Strabismus can cause the child to fail in sight-based tasks. In addition, the visually impaired child may be ridiculed by his friends when he reaches play age and may not be allowed into games. This situation causes different reactions in the child. Children may be embarrassed, timid, introverted, or angry.

You can watch this video that explains how the life of a person who lost his sight later changed.

To translate into your language, open the subtitle, click the subtitle again in the settings section, then click the automatic translation and select the option.

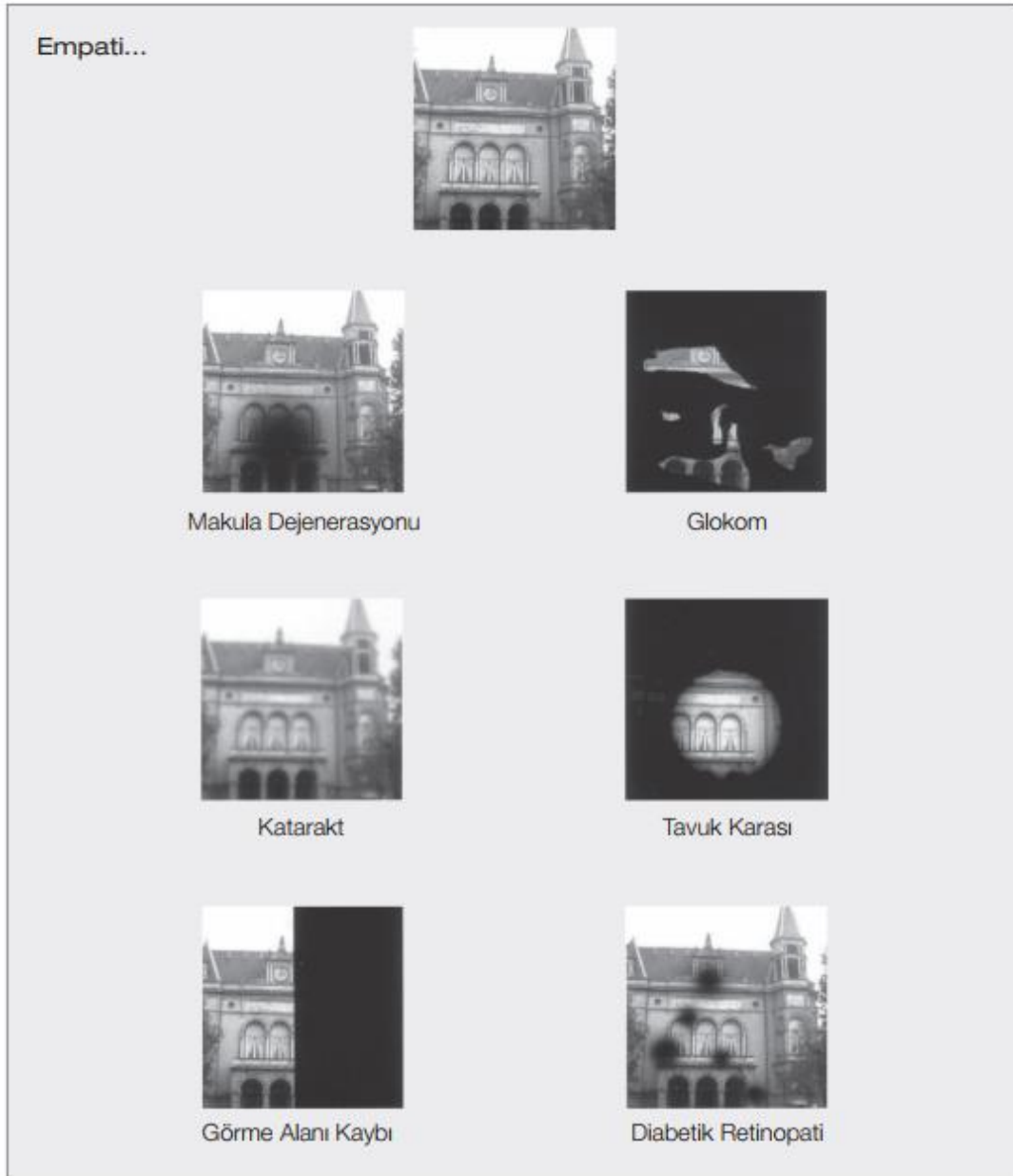
Video link: [Chris Downey: Görme engellileri düşünerek dizayn etmek | TED Talk](#)

Taking into account the past life of the visually impaired individual, a series of tests and questionnaires that will reveal the feelings and thoughts, and empathy will help us to reveal healthier results.

Implemented in Turkey, 'Dialogues in the Dark'; As we participate in some activities that will help us understand how they perceive the world.

Again, depending on the degree of visual impairment, some simple activities that are implemented in our classroom will contribute to the empathy skills of both us and our students.

For example, we can empathize with individuals with visual defects by looking at the figure below to make some small changes in simple glasses.



Resim 1. Görme problemlerine göre kişinin algısı

Perception of the person according to the vision problem



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6.1.2 ACTIVITIES

UNDERSTANDING A DISABLED FOR 15 MINUTES ...

Theme: Disability Rights.

Subject: Difficulties in the Lives of People with Disabilities.

Purpose: 1) To experience the difficulties experienced by disabled people,
2) To empathize with disabled people about the difficulties they experience,
3) Correct and effective communication with the disabled.

Method: Role Playing, Group Work

Duration: 45 + 45 min.

Materials: At least half of the group, dolls and their clothes, removable-removable items or toys, , scarf etc.

Preparation: Make sure that the necessary toys, tools, dolls and dolls outfits for the event are complete. Keep these objects out of the sight of the participants. Try to have 20 people in the ideal group. Divide the participants into two groups. Choose the people to be in the group from among the volunteers.

Encourage them by telling them that they will have a different experience. II. Create the group from the remaining people.



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Activity Process: Take the volunteer group a few floors down, or take it out if possible. In the meantime, ask the people staying in the study room to change the classroom seating arrangement and then come downstairs / outside. However, when you come, tell the other group that they should not show themselves. Ask all volunteers to go to their classes blindfolded.

When the blindfold takes action, the other group is allowed to join them, check their friends with the tip of their eyes, and help them silently to prevent an accident. When they come to the front of the room / classroom, the open-eyes group will be seated immediately.

Then, the blindfold group is told, "Friends, our class arrangement has changed today, but you will be sitting with the same friends again." Say that you will send them two by two to avoid confusion. Make sure that other friends find their places with their voice commands. Once they find it, they can open their eyes.

In the second stage, the eyes of the other group are tied. Previously prepared toys or equipment (removable and mountable), baby and baby clothes are placed in front of them. They are asked to guess what might happen to this toy / gadget being dispensed. For those who do not know, it is said in the correct answer. Subsequently, the people who received the distributed / disassembled toy are asked to reassemble all parts of the toy. Those who are given a baby are asked to dress the baby's clothes. The event is completed within a maximum of 15 minutes, regardless of whether the given tasks are completed or not. The experiences of the participants about the event are taken and the process is completed with evaluation questions.



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Evaluation questions of activity

- 1) (General) What did you feel when your eyes were first closed?
- 2) (Group I) Have you ever felt anxious to hit a place or a person while moving?
- 3) (Group I) Did you find it difficult to find your new places in the classroom / hall?
How helpful has your friends' referral helped you? Why?
- 4) (General) If he were really visually impaired instead of you, would he have had as much difficulty as you?
- 5) (Group II) Was it difficult to combine / match something without seeing it?
- 6) (Group II) How helpful were your friends' instructions? Why?
- 7) (General) Does this activity affect your future behavior towards visually impaired people? How?

6.1.3. General Review

Knowing the general characteristics of visually impaired individuals makes it easier for people to approach them. It also allows us to empathize with healthier. These effects reduce the self-centered thinking of the person, strengthen communication and provide social acceptance.

It ensures the continuation of the established communication and reinforces the feeling of helping. It provides a comfortable understanding of the emotional state of the other person. For this reason, it



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helps to establish deep communication by understanding other individuals in more detail.

Empathy plays an inevitable role for the emergence and development of learning behavior in the classroom environment. Individuals who feel that they are not understood in the classroom environment and who think they do not see value will not be able to participate in learning activities and will not be able to show self-disclosure behavior in various situations.

Bell (1989) stated that successful inclusion depends on five elements: attitudes, skills, resources, organization and curriculum.

The teacher should be able to comprehend what the students in the normal development process think and feel due to being in the same environment with the mainstreaming students. In addition, the teacher should be able to understand how students with special needs in the classroom are affected by the behavior and expressions of their normal peers. For this, the teacher should have an empathetic perspective.

The fact that parents do not encourage their visual impaired children to play with sighted children causes these children to be introverted and withdrawn. In addition, this attitude of the parents may cause the child not to recognize his environment properly and to lack self-confidence in the child.