

COMPLEX LEARNING DIFFICULTIES AND DISABILITIES RESEARCH PROJECT (CLDD)

SENSORY IMPAIRMENT

This is a general overview of the implications of vision impairment, hearing impairment and multi-sensory impairment. The impact of impairments for individual students with complex learning difficulties and disabilities would need to be analysed in depth.

Vision impairment (VI)

Almost two million people in the UK are living with sight loss (Access Economics, 2009). In terms of registered vision impairments, there are around 370,000 people registered as blind or partially sighted in the UK.

Of this there are an estimated 25,000 blind and partially sighted children in Britain (Morris and Smith, 2008). Rahi and Cable (2003) found a cumulative incidence (similar to prevalence) of severe sight loss or blindness of 5.9 per 10,000 children, for children up to the age of 16 years. Emerson and Robertson (2011) estimate that more than 23,000 children and young people aged 0 - 19 with learning disabilities in the UK are blind or partially sighted.

The term vision impairment (VI) covers varying degrees of vision loss including those who are registered severely sight impaired (blind). Even the latter may have some vision, such as being able to tell the difference between light and dark. There are many conditions that cause different kinds of vision loss, the main distinction between conditions is whether the impairment is caused by a problem with the eye (ocular) or brain (cerebral/cortical). Cerebral/cortical vision impairment tends to be the more common form of visual impairment in children with CLDD/PMLD and VI. Functional vision refers to the interaction between the environment and how the visual information is processed. Knowing a student's condition and degree of functional vision may help staff to understand what they can see (Mason, 2001).

Impact of VI on development and in the classroom

Vision plays a vitally important role in both early developmental learning and academic learning (Day, 1997). One characteristic shared universally by children with VI is that they are limited in their ability to learn incidentally from their environment. Since vision is the primary sense through which a student would typically explore, organise, synthesise and integrate information about their environment, its absence or limitation significantly impacts upon a student's curiosity, exploration and information gathering ability. This reduced or sometimes inability to pick up visual cues makes students with VI susceptible to 'learned helplessness' whereby they exhibit passive and/or helpless behaviour (Seligman, 1991).

Consequently, VI may lead to students being delayed in other areas of development including cognitive, physical, emotional and neurological (Day, 1997) and to struggle in their attainment of key developmental milestones such as acquiring communication and social skills, attaining orientation, mobility and life skills, and understanding abstract ideas and concepts. For this reason, it is essential that students with VI are provided with opportunities for personal as well as academic development (NICHCY, 2004; Waldron et al, 2006).

According to Pagliano (1994), 80% of traditional education is presented visually. Consequently:

...the student with vision impairment may lag behind in achievement in comparison to sighted peers due to the impact of visual impairment on learning. (Waldron et al, 2006, p 3)



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In such cases, it has been confirmed that special educational support in the form of specific instructional techniques, materials or assistive devices are essential if the student's engagement in learning is to be optimised (Miller and Levack, 1997). In the early years, assistance is required to help overcome the constraints imposed by limited vision. Rates of learning will vary widely from child to child. The Developmental Journal (2006) points out that there is no middle cluster of children with little or no sight that can be considered 'average' or 'typical'. (Developmental Journal-General Overview, 2006, p 21)

In order to determine the unique educational needs and abilities of a student with vision impairment, it is important to consider a variety of factors relating to this. These include: 'type of eye condition; age of onset; degree of functional vision; type of intervention provided' (Waldron et al, 2006). Gaining an understanding of these factors will help identify the unique educational support requirements of a student with VI (Anderson, 2003).

The impact of VI on learning is also interrelated with any coexisting disabilities. A study by Mervis et al (2002) found that nearly two thirds of children with VI had a comorbid diagnosis, indicating an extremely high prevalence of complex needs amongst this population of students. This finding is supported by NICHCY who state that:

Many children who have multiple disabilities may also have visual impairments resulting in motor, cognitive, and/or social developmental delays. (NICHCY, 2004, p 2)

In addition, people with learning disabilities have been found to be between 8.5 and 200 times more likely to have a vision impairment compared to the general population (Warburg, 2001). According to Rahi and Cable (2003) 77% of children newly diagnosed with VI had additional disorders or impairments.

Some key instructional techniques for students with vision impairments include:

- Ensuring access to a qualified teacher of children and young people with VI or a VI specialist
- providing appropriate resources (eg braille, large print, etc) (ISAC, 1999)
- providing opportunities for experiential learning involving the use of real-life objects which the student can touch (Sewell, 2005)
- providing information through oral or tactile means; for example, verbal instruction (Van Wagner, 1994) and tactile pictures (eg Wikki Stix). Particularly for children and young people with CVI, it is important to be aware that:

Many students who have visual impairments with other disabilities have auditory perceptual delays. Although these students may be able to hear, they are unable to process information auditorily; they exhibit difficulties with auditory memory and with following a sequence of directions. (Sacks and Silberman, 1999)

Vision 2020 UK (2010) highlight that, in order to meet the needs of children and young people with reduced vision, it is particularly important to ensure that consideration is given to:



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- Transition to adult services:** Involve the student, their family and carers, health care specialists, specialist teachers and social care staff to enable a seamless transition relating to all the student's different service networks. This should enable a smooth move into adult services.
- Emotional wellbeing:** Take into account the impact of this in all areas of the young person's life.
- Equipment:** Provide optical and non-optical equipment with an emphasis on enabling a young person to develop the skills to the make best use of the sight they have.
- Timing:** Support should be timely and accessible.
- Habilitation (holistic):** Enable students to develop independence and life skills, including practical skills of daily living and mobility.

The classroom environment is a particularly important consideration for students with VI. They need opportunities to familiarise themselves with the classroom environment without other students present. Concrete (permanent) objects such as furniture and flooring can be used to distinguish between different areas of the room, as can sounds and smells (Baldwin, nd; Sewell, 2005). In addition, a habilitation (orientation and mobility) specialist should be employed to teach the student to travel independently outside and between the classrooms.

It is also important to consider glare within the classroom caused by reflection from lighting and the sun. Blinds, indirect lighting and dimmers should be available to reduce glare, and careful consideration should be given to where best to position the student to ensure optimal visual conditions. Many students with VI will also need assistance with organisational skills. Providing specified places for items to be kept, and containers to store items can assist with this (Francis and Clark, 2003; Waldron et al, 2006).

In order to gain an understanding of abstract concepts and ideas, students with VI will need frequent, repeated instruction, as well as opportunities for multisensory learning through relevant tactile, auditory, olfactory and gustatory means (Francis and Clark, 2003; Sacks and Silberman, 1999; Waldron et al, 2006). Conceptual understanding plays an integral role in the development of meaningful language, and thus is also a key step in the attainment of effective communication skills for students with VI (Bishop, 1996). Students with VI who have reduced conceptual understanding have been found to show poor social use of language (Tadic et al, 2009).

The Developmental journal for babies and children with visual impairment (2006) provides comprehensive information and suggestions for support in the early years. It describes the different areas of development in children with visual impairment and makes the point that they are often overlapping and inter-related. The key areas of development that are covered are social and emotional development, communication, language and meaning, play and learning, movement and mobility and independent self-care.

To assist students with VI in gaining literacy skills, it is important to ensure that the text is as legible as possible. This involves:

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- printing text with the highest possible contrast (eg black and white – light letters on a dark background may be more legible than dark letters on a light background)
- avoiding colour combinations in text/background which produce visual disturbance
- keeping background uncluttered
- ensuring large, bold fonts are used (eg size 18 bold)
- ensuring lines of text are widely spaced and justified to the right
- using simple typefaces, such as Arial
- providing thick paper (so that text does not come through from the reverse side) with a matt finish (glossy finishes can exacerbate glare problems)
- using a line marker to track text

(Francis and Clark, 2003; RNIB, 2011)

Similarly, to aid writing, large felt pens and pencils and thick paper with raised or bold lines can be beneficial. Computers can be introduced to facilitate independent writing further, and additional assistive technology such as screen enlargement may also be beneficial (Francis and Clark, 2003; Waldron et al, 2006).

The absence or reduction of incidental visual learning also impacts significantly on the development of social skills. It is therefore essential that students with VI are provided with social skills training to learn socially appropriate behaviour and interaction skills (Sacks and Silberman, 2003). The importance of this is highlighted by the fact that social skills are also closely intertwined with self-concept, self-esteem and mastery. 'These students [with VI] may experience low self-esteem that limits their sense of mastery over their own lives' (Project IDEAL, nd). Consequently, supporting students to gain social skills, self-confidence and self-respect is essential for their overall wellbeing (Miller, 2006).

As stated by Waldron and colleagues (2006):

Social skills are...essential...as are basic reading and writing skills. Social skill acquisition is the preferred vehicle for promoting academic learning, a sense of belonging and acceptance, psychological wellbeing and positive self-concept. Social skills are the critically important precursors to your student building positive relationships with his or her peers at school.

Furthermore:

Research has indicated that sensory impairments are more common in people with ID [intellectual disability] ... [and] psychiatric disorders are believed to be more common in children with visual impairment (VI) when associated with other handicaps. (Carvill, 2001, p 467).

Hearing Impairment (HI)

According to the latest figures from the RNID, 840 babies are born each year in the UK with significant hearing impairment (RNID, 2005). A study by Davis and Hind (1999) found that one in 752 children aged 4–12 years in the UK had a permanent hearing loss. As with VI, hearing impairments can arise from many

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different causes, and appear in a variety of forms. Hearing impairment is usually categorised into:

- **Conductive hearing loss**, which is the most common type and results from interference in the conduction pathways through which sound reaches the inner ear. This hearing loss usually affects the volume of sound reaching the inner ear. People with conductive hearing loss may benefit from the surgical insertion of grommets or from hearing aids. It is commonly a temporary hearing loss.
- **Sensorineural hearing loss**, which is caused by damage to the hair cells lining the inner ear, or the nerves that supply them. This hearing loss can range from mild to profound, and affects certain frequencies more than others. Consequently, people with sensorineural hearing loss need high quality hearing aids or cochlear implants to gain access to the spoken word and sound in the environment.
- **Mixed hearing loss**, which arises from both the above.
- **Central hearing loss**, which results from damage to the relevant nerves in the central nervous system or the brain.

Understanding these different types of hearing loss and their impact is essential for the provision of appropriate educational support (Watson, 2003).

Impact of HI on development and in the classroom

Like sight, hearing plays a vital role in the learning process. HI can cause delays in the development of both receptive and expressive communication skills. Consequently:

Communication is a key issue for deaf...people and difficulties here underlie developmental, psychological and emotional problems, and delay or prevent appropriate assessment and treatment. (Feu and Fergusson, 2003, p 95)

Students who have hearing loss may find it more difficult to learn various aspects of verbal communication, including vocabulary, grammar and word order (NICHCY, 2004). Consequently some will communicate through a combination of oral (including speech and speechreading) and manual (including sign language and fingerspelling) methods. Providing a student with HI with a language in which they can be fluent is essential for effective social interaction whether spoken or signed.

Some key instructional techniques for students with hearing loss include:

- advice and support from an appropriately qualified teacher of the deaf or specialist
- providing opportunities for hands-on learning
- providing visual resources
- providing appropriate technology such as hearing aids
- ensuring the teacher faces the student whilst speaking and speaks clearly to encourage speech reading
- using Total Communication a combination of speech, signs and fingerspelling, where appropriate.

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For students with HI, the suitability of the classroom learning environment is crucial. Students wearing hearing aids may struggle to tune out background noise in order to hear what is important. Simple steps can be taken to improve the acoustics within a classroom, including using carpet, putting rubber tips on chair legs, using soft furnishings such as tablecloths and curtains, placing acoustic tiles such as carpet tiles on the walls, and shutting doors and windows to eliminate external noise (Waldron et al, 2006). Such accommodations will assist the student to concentrate and engage in learning. In addition, providing a student with HI with appropriate seating is also important. The student should be able to see the teacher and their classmates easily in order to follow conversations. A recommended classroom configuration is a U-shape (Tvingstedt, 1995). It is also important for the speaker to be aware of where to stand when talking. Standing in front of a window, for example, will create glare which prevents the student from seeing the speaker clearly.

The impact of HI on learning is also interrelated with any co-existing disabilities. According to Feu and Fergusson (2003, p 95), 'children *with HI+ may have additional problems associated with the cause of their sensory impairment and need early multi-disciplinary intervention'. Pollack (1997) adds that 'the occurrence of other disabilities in combination with HI...significantly adds to the complexity of educating the student who is deaf or hard of hearing'. This has implications for the classroom. Alternative forms of visual communication such as Makaton, pictures or symbols may be effective for students with HI who also have learning/intellectual disabilities (Chalk, 1996), while clearly defined expectations and choices, as well as appropriate counselling and support, have been found to be beneficial for those with SEBD (Gage et al, 1994; Rasing and Duker, 1993).

Multisensory impairment (MSI)

Students with multisensory impairment have a combination of visual and hearing losses. They are sometimes referred to as deafblind, but many have some residual sight and/or hearing. There are an estimated 23,000 deafblind people in the UK (RNID, nd). Nowadays extreme prematurity and severe infections are the most likely causes of MSI from birth or soon after. These students may also have learning difficulties and additional disabilities which compound the difficulties arising from MSI, resulting in extremely complex needs (OnetoOne, nd). In addition, high anxiety, multisensory deprivation and behavioural and emotional difficulties often accompany deafblindness as a result of the student's inability to understand and communicate (Miles, 2008, p 2).

Impact of MSI on development and in the classroom

The combination of the two sensory losses intensifies the impact of each. Students with multisensory impairment have much greater difficulties in accessing the environment, and consequently an educational curriculum, than those with a single sensory impairment. Incidental learning is very reduced, since the combination of HI and VI 'can severely limit an individual's natural opportunities to learn and communicate with others' (NICHCY, 2009). Consequently, MSI 'slows the pace of learning, affecting especially:

- communication and the development of relationships
- mobility and interaction with the physical environment
- the processing and integration of information from residual hearing, vision and other senses
- the perception of time and space

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- the transfer and generalisation of skills and concepts
- the development of abstract reasoning.'

(Murdoch et al, 2009, p 10)

Perhaps more than any other group, for students with MSI, 'achievement...depends in large part upon the education they have received since childhood' (Miles, 2008, p 2). According to Victoria School in Birmingham, a curriculum for multisensory impaired students must:

- begin from a very limited knowledge base
- include the teaching of strategies for interacting with the social and physical environment
- provide frequent repetition and redundancy of information
- be accessible by students with any combination of sensory impairments
- emphasise a sense of self, agency and negotiation
- offer breadth, balance and relevance
- link learning opportunities to support the generalisation of concepts
- encourage progression in terms both of new learning and of the extended application of existing learning.

(Murdoch et al, 2009, p 12)

A number of specialist approaches and techniques have been developed which support the development and education of students with MSI. These include:

- consistent, well-cued routines
- secure and stable environments (both social and physical)
- movement-based learning
- intensive interaction
- a wide range of communication options including speech, gesture, British Sign Language, braille, objects, symbols, etc
- interpreting all the student's behaviours as communication
- matching the pace of interaction to each student's sensory abilities
- ensuring the environment provides optimal visual and auditory conditions
- a cross-curricular, multidisciplinary approach.

(Murdoch et al, 2009)

Furthermore:

Education for a child or youth with deaf-blindness needs to be highly individualised; the limited channels available for learning necessitate organising a program for each child that will address the child's unique ways of learning and his or her own interests. (Miles, 2008, p 3)

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As Miles (2008) says: 'The challenge of learning to communicate is perhaps the greatest one that children who are deaf-blind face' (p 2). Those who have this extremely complex disability often require specialist communication methods and systems that not only they, but also those around them, must become familiar with (OnetoOne, nd). Most often, the hands become not only the tools and sense organs for those born deafblind, but also their primary means of expression (Miles, 2003). It is therefore 'crucial for educators...to present information so that it is accessible to the hands' or, in other words, to 'speak*+ the language of the hands to the hands' (Miles, 2003, p 1).

However, for students who are deafblind, learning to use their hands even as tools takes far longer than for seeing and hearing students. Thus achieving the use of their hands as tools, sense organs and voice is a considerable challenge. For students who have some residual hearing and vision, utilising this is essential in enabling them to achieve maximum use of their hands. For students with no residual sight or hearing, it is crucial that they be encouraged to use their hands to explore the world. To this end, educators should:

- watch / touch the student's hands and learn to 'read' them
- be aware of what the student's hands are touching, instigate shared attention on any object being touched, and encourage the student to touch objects
- use hand-under-hand touch to explore objects together and thus lay the foundation for communication
- make their own hands available for the student to manipulate as they wish
- use hand-under-hand touch to imitate the student's own hand actions
- play interactive hand games provide a touch-encouraging environment
- encourage energetic throwing.

(Miles, 2003, p 5–9)

In order to provide deafblind students with the motivation to learn to move, their environment should be carefully considered to ensure that it is safe, and that any instinctual movement is met with reward. Furthermore, it is likely that many deafblind students will have additional physical or health needs which limit their ability to move. A variety of specialists such as orientation and mobility specialists and physical and occupational therapists may be required to ensure that these students reach their potential in terms of mobility and independence.

Useful websites

RNIB – VI and complex needs

http://www.rnib.org.uk/professionals/education/schoolbasedlearning/complexneeds/Pages/complex_needs.aspx

www.RNID.org.uk

www.RNIB.org

www.deafblind.org.uk



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www.batod.org.uk
www.natsip.org.uk
www.sense.org.uk

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