

Teaching and learning environments to support students with special education needs or disabilities

FACTSHEET

This factsheet summarises research aimed at better understanding how the features of modern teaching and learning environments support the provision of an inclusive educational environment. It is intended to act as a guide for those involved in the visioning and design of any form of schooling facility that includes delivery of education to students with special needs or disabilities.

This factsheet should be read in conjunction with other factsheets in the series which are also relevant for students with special education needs. This factsheet focuses on key findings directly related to teaching and learning environments and special education needs.

Teaching and learning spaces

Teaching and learning spaces should be of a sufficient size to support a number of different teaching and learning activities. Considerations for students with special needs include:

- A sufficiently sized learning space will support additional space requirements, for example, for students with mobility aids, students accompanied by a teacher aid, those who use modified furniture or equipment and students who need more physical space between them and their peers.
- Learning spaces should have minimal fixed partitions, furniture, fittings or other equipment to allow the space to be reconfigured to support different activities and to address different student needs. This offers a more inclusive environment. Rearranging furniture allows students to work individually, in groups or as



a whole class and teachers to facilitate learning from different locations within the learning space.

- A kitchenette in the learning space to assist with teaching, but also to have easy access to hot and cold water and other cleaning materials. A kitchenette can also be used for food preparation for students who have particular dietary requirements.
- Break out/support spaces – small spaces for teachers and other professionals to work with individual students or small groups. This supports the relationship between student and teacher and provides a quiet space to calm down and re-focus when needed.
- Close proximity of break out spaces to main learning spaces. This is important for easy accessibility, to reduce distress during transit and for students to remain connected to the class.



Heating

Students with special education needs may be more sensitive to fluctuations in temperature. For example, special education needs students with low mobility may frequently wet clothing and require changing. Therefore, being able to control the room temperature to the appropriate level will be helpful to ensure comfort.

This is particularly important for students who are not able to communicate distress due to temperature extremes, meaning that teachers need to be able to monitor the student closely, and adjust the temperature accordingly.

Traditional radiator heating systems provide direct heat and may be a health and safety risk for students with very high levels of needs. Consideration of the positioning of radiator heating systems is required for example-ensuring that they are positioned higher on walls to minimise this risk.

Where students' special education needs mean that they overheat easily, a heating system that can be used to cool the classroom in addition to heating it may be useful.

Lighting

Many studies report the positive impact of appropriate lighting levels and lighting sources on student outcomes. Studies tend to agree that natural lighting is preferable. Specific considerations for students with special education needs include:

- The level of contrast should be appropriate to assist visually impaired students with orientation and navigation around the school and enable hearing impaired students to easily see the faces of speakers against the background. For example, windows behind the teacher makes the teacher's face darker than the surroundings, which can create difficulties for visually or hearing impaired students.
- The location of interior and exterior windows can be distracting, particularly for students with certain special education needs, such as students with Autism Spectrum Disorder (ASD).
- Clerestory windows are more prone to creating shifting patterns of light and shade, which can create visual barriers that may cause distress for some students with special education needs. Consideration should be given to the use of a permanent



sun-shading structure extending from the facade of the building to diffuse direct light, and create consistency in light distribution as it enters the classroom.

- Control over lighting maximises its effectiveness and increases opportunities to meet the diverse requirements of special education needs students. Controllability of lighting allows the teacher to alter lighting levels to create a more calming or stimulating environment, depending on the learning activity and the needs of the students.
- Ideal lighting will depend on the specific special education needs of the students. Visually impaired students, for example, will rely on strong sources of light to enhance their ability to see and hearing impaired students will need a level of light that supports lipreading and signing.
- Minimising glare is important for students with special education needs.

Ventilation

Many studies have reviewed the impact of adequate ventilation on Indoor Air Quality (IAQ), and conclude that there are negative health consequences for both students and teachers if IAQ is poor.

Students with special education needs or disabilities that are related to high levels of health needs are often the most vulnerable to poor IAQ. Poor ventilation often leads to health issues resulting in absenteeism or inattention in class.

During the design stage careful consideration should be given to natural ventilation and the control of ventilation systems.

Acoustics

A British study found that classroom noise level negatively impacted all students, but particularly students with special education needs. Acoustics are important to consider for students suffering from long-term hearing impairments, but also for students who may have short-term hearing loss from ear infections or allergies. Case studies reflect that improvements to learning space acoustics enhances the extent to which students with hearing impairments are able to hear adults and peers.

Considerations for students with special education needs are:

- Limiting reverberation.
- Having a visually connected but quieter adjoining space.
- Arranging classroom layout to ensure that hearing impaired students are closest to the teacher.
- Strategies to minimise or eliminate sudden loud noises can support the benefits of an appropriate acoustic environment for students who find sudden noise distressing. For example, rather than having school bells set to ring at a volume that may upset some students, a visual signal accompanying the bell will assist hearing impaired students. This will allow the bell to be rung at a lower volume.

Technology in the form of a sound-field amplification system can be used to increase the volume of the teacher's voice, and therefore improve the signal-to-noise ratio. A New Zealand study using sound-field amplification for students with Down's Syndrome found that the students were able to perceive significantly more speech when the teacher's voice was amplified by 10 decibels. An



American study found that students with developmental special education needs made fewer errors on a word identification task when a sound-field amplification system was used.

Other key considerations

Other key considerations for students with special education needs include:

- High dependency bathrooms should be centrally positioned within the school site and wheelchair accessible toilets should be located in a number of convenient locations throughout the school to avoid lengthy absence from class.
- Outdoor space: The type and size of playground equipment should cater for a wide range of student ages and intellectual development levels as well as the potential larger size and weight of older students.

- Sensory gardens and gardens with planting areas for students need to consider spacing of the planting beds and providing a sufficient mix of hard and soft landscaping so that students with wheelchairs or other mobility aids can access the garden.
- Security must be taken into account when designing outdoor spaces for students with special education needs and/or disabilities. The possibility for adults to observe the students unobtrusively adds to the safety of the outdoor area.
- An adequate area with no curbing should be provided in the pick-up / drop-off area. The entrance of the school should be covered to provide shelter for students entering and exiting cars and taxis.
- There must be equitable and sufficient vertical access (ramps, lifts, hoists etc) located in appropriate places around the school.
- Storage must be of sufficient size, type and location to include space for appropriate storage of special equipment.
- Some items, including mobility aids and other assistive devices, will require storage at multiple points around the school.
- Bright colours and complex patterns may overstimulate some students. Neutral or pastel colours are more soothing, and brighter colours can be introduced through displays of student work.
- Colour can be used as a visual aid, such as in marking routes and using contrasting colours or layers of colour to define spaces or objects, such as step edges.

- Special adaptations to furniture and equipment, such as wheelchair seating in an assembly hall or lowered lab stations in a science classroom should be readily accessible and located centrally to promote inclusiveness.
- Give consideration to the types of equipment that will be used in conjunction with adjustable furniture. For example, consider the location of gas outlets in a science laboratory with adjustable benches.

