ASE guide to Special Educational Needs and Disabilities

Dyslexia, dyspraxia and dyscalculia

Dyslexia – the British Dyslexia Association (BDA)

10% of the UK population is dyslexic, 4% severely so. Many of the dyslexic people across the UK, whether adults or children, are unable to fulfil their potential, as a large percentage of the population still do not understand what dyslexia is, the difficulties that the condition presents and do not know how best to support them. Dyslexia is not an obvious difficulty; it is hidden. As a result, dyslexic people have to overcome numerous barriers to make a full contribution to society.

The BDA promotes early identification of specific learning difficulties (SpLD) and support in schools to ensure opportunity to learn for dyslexic learners. The BDA has three campaign areas:

- To encourage schools to work towards becoming dyslexia-friendly;
- To reduce the number of dyslexic young people in the criminal justice system; and
- To enable dyslexic people to achieve their potential in the workplace.

Being able to identify signs of dyslexia in the education environment is beneficial for both the student and the teacher/tutor. The information contained within the Educators section of the BDA website (www.bdadyslexia.org.uk/educator) provides useful hints and tips for educators of all levels and also students, as well as vital information on access arrangements, screening and assessment.

Dyspraxia and science education – The Dyspraxia Foundation

Dyspraxia/DCD is a poorly understood but very common developmental disorder affecting some 5% of the population. It is a lifelong condition affecting fine and/or gross motor co-ordination, in children and adults. Dyspraxia also affects planning, organising and carrying out movements in the right order in everyday situations. Dyspraxia can also affect articulation and speech, perception and thought.

Although dyspraxia may occur in isolation, it frequently co-exists with other conditions, such as Attention Deficit Hyperactive Disorder (ADHD), dyslexia, language disorders and social, emotional and behavioural impairments. The Dyspraxia Foundation is proud to be the only countrywide charity devoted to raising awareness of dyspraxia and supporting and guiding the people who can influence the lives of those with dyspraxia.

Children without a diagnosis can be puzzling, appearing to struggle with understanding concepts, following instructions, focusing on a subject and, most noticeably, with the recording of information, as handwriting is a real problem. This, coupled with the deficits in perception and motor co-ordination, can make science subjects at best tricky and at worst downright dangerous, with a likelihood of spillage, issues with measuring and the actual handling of apparatus.

The most important consideration is the acknowledgement of these difficulties, as children with dyspraxia show no outward signs of the condition. They can struggle in silence and never reach their potential if the difficulties are not recognised and supported appropriately.

Strategies in the classroom may include practical interventions, such as:

- The use of Dycem, or other non-slip surfaces, to secure apparatus;
- Allowing the use of a laptop or iPad to record information;
- 'Buddying up' a student with someone capable and sensitive who can help with pouring and cutting exercises;
- Introducing new scientific language in advance;
- Highlighting important instructions and allowing a student more time to carry out and complete tasks;
- Providing handouts to reduce the need for handwriting;
- Ensuring enough space in which to work;
- A supportive chair and an organised work space;
- Breaking down activities and tasks into smaller components;

- Teaching the child strategies to help them remember and organise themselves (e.g. use of diaries and lists);
- Asking the child to repeat instructions back to you;
- Helping with short-term visual memory by not expecting the child to copy large blocks of text;
- Using strategies to help with copying from the board; for example, using different colours per line or giving a ruler to copy text for each line;
- If demonstrating activities, breaking down the tasks into stages and giving a few at a time;
- Allowing the child to finish a task before moving on; they will feel a failure when work is consistently left incomplete, especially for the first few months following transfer to secondary school; and
- Ensuring that all instructions are always clear and precise.

The Dyspraxia Foundation has a considerable amount of information on its website and runs a helpline to assist teachers and individuals with specific issues. The Foundation can help to find sources of support in your area. It publishes a range of leaflets, booklets and books on aspects of the condition and can provide bespoke INSET training to meet your needs. The Dyspraxia Foundation is always happy to help. It has an excellent school membership package to keep you updated with all news and current information and research relating to the condition. Visit us at www.dyspraxiafoundation.org.uk, find us on Facebook and twitter, or ring the Helpline on 01462 454986.

Dyscalculia

'Dyscalculia is a specific and persistent difficulty in understanding numbers which can lead to a diverse range of difficulties with mathematics. It will be unexpected in relation to age, level of education and experience and occurs across all ages and abilities.

Mathematics difficulties are best thought of as a continuum, not a distinct category, and they have many causal factors. Dyscalculia falls at one end of the spectrum and will be distinguishable from other maths issues due to the severity of difficulties with number sense, including subitising, symbolic and non-symbolic magnitude comparison, and ordering. It can occur singly but often co-occurs with other specific learning difficulties, mathematics anxiety and medical conditions.

Because definitions and diagnoses of dyscalculia are in their infancy, it is difficult to suggest a prevalence, but research suggests that it is around 5%. However, 'mathematical learning difficulties' are certainly not in their infancy and are very prevalent and often devastating in their impact on schooling, further and higher education and jobs. Prevalence in the UK is at least 25%. We would suggest that there is a spectrum of difficulties.

Developmental Dyscalculia often occurs in association with other specific learning difficulties, such as dyslexia, dyspraxia or ADHD/ADD. Co-occurrence is generally assumed to be a consequence of risk factors that are shared between disorders: for example, poor working memory. However, it should not be assumed that all dyslexics have problems with mathematics, although the percentage may be very high, or that all dyscalculics have problems with reading and writing. This may well be a much lower percentage.

The roots of dyscalculia

Quite sensibly, we expect children to develop at different rates; this is especially the case for young children. Thus it is difficult to target an age where a teacher might realistically suspect a child has dyscalculia. However, the problems with maths start with the earliest arithmetic; for example, recognising small quantities and attaching the correct name and symbol to quantities.

Progression to counting can create an illusion of learning. A child might learn to count to twenty, but in that (conceptually under-estimated) task, the child has met place value and an introduction to addition (in ones). The task of counting backwards is more challenging and too many children fail to automatise this task. It involves working memory, reversing a sequence and subtraction.

In these early stages (as indeed do older learners), children need appropriate materials and visual images, linked explicitly to the symbols and concepts they represent. It should be a sophisticated matching.

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Typical symptoms of dyscalculia/mathematical learning difficulties

- Difficulty when counting backwards.
- A poor sense of number and estimation.
- Difficulty in remembering 'basic' facts, despite many hours of practice/rote learning.
- The only strategy used to compensate for lack of recall is to count in ones.
- Difficulty in understanding place value.
- No sense of whether any answers that are obtained are right or nearly right.
- Slow to perform calculations.
- Forgetting mathematical procedures, especially when complex: for example, 'long' division.
- Addition is often the default operation.
- Avoiding tasks that are perceived as likely to result in a wrong answer.
- Weak mental arithmetic skills.
- High levels of mathematics anxiety.

Because mathematics is very developmental, any insecurity or uncertainty in early topics will impact on later topics, hence to need to take intervention back to basics.

What help is available?

Maths Learning Difficulties, Dyslexia and Dyscalculia (Oct 2018), this BDA publication is available to purchase from our shop. (http://www.bdastore.org.uk/books/maths-learning-difficulties-dyslexia-and-dyscalculia-second-edition-1/)

Policy, Research, Identification and Intervention for Maths Learning Difficulties and Dyscalculia (2015): BDA Dyscalculia Committee. (Free pdf download)

Maths Explained video tutorials created by Dr. Steve Chinn, a leading authority in the field of dyscalculia. (https://www.mathsexplained.co.uk)