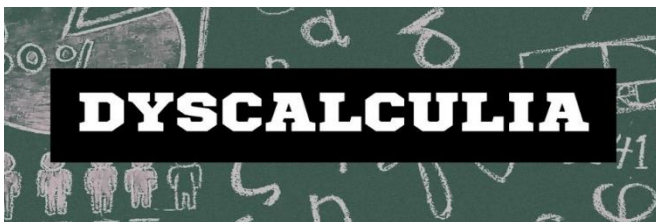


What is Dyscalculia?

Dyscalculia is a learning difficulty which affects an individual's ability to comprehend numbers and process and retain mathematical concepts (Resminati Dinda Salisa and Meiliasari, 2023). According to the British Dyslexia Association, mathematics struggles are on a spectrum of varying severity. Dyscalculia is at the more severe end of the spectrum and is considered a cognitive developmental disability, as it is associated with brain function, specifically the frontal lobe (Ferrie, 2022). Furthermore, studies suggest dyscalculia can be considered a condition with genetic influence, with there often being multiple individuals within a family having diagnoses of dyscalculia (Pettigrew, 2015). Moreover, research has found that there is a correlation between those individuals diagnosed with dyscalculia, also having other developmental learning difficulties, such as dyslexia (Ulfarsson, 2017).



Why is it important to raise awareness?

Six percent of the population in the United Kingdom live with dyscalculia and one in four people face varying severities of learning difficulties in mathematics (BDA, 2024). Furthermore, under the Equality Act 2010, dyscalculia is a recognised disability (UK Government, 2015). Despite this, it has been suggested that research on dyscalculia is around 30 years behind compared to research on dyslexia (Ferrie, 2022).

Identifying dyscalculia and barriers faced.

Within the early years, there are often noticeable and consistent learning signs and symptoms children with dyscalculia face, which teachers and educators can look for. Children will have difficulty with numbers and counting. They may struggle with number recognition and there may be an obvious disconnect of understanding of quantities, i.e. more than, less than, longer, shorter, or lighter and heavier. Children may show problems with their mental arithmetic skills, including basic mathematical operations like addition, subtraction, division and multiplication. They often make mistakes in simple calculations and have difficulty remembering basic mathematic information. Furthermore, children with dyscalculia have difficulty recognising patterns, sequencing numbers and copying shapes. Their processing speed is often slower than their peers and they take a noticeably longer amount of time to complete maths tasks (Resminati Dinda Salisa and Meiliasari, 2023). Dyscalculia creates other cognitive challenges, such as a poor working memory and difficulty following instructions with multiple steps. This becomes frustrating for children who work hard to learn a new maths skill, only to realise the following day that their poor working memory has meant they have completely forgotten the new skill and must start the learning process again. Children with dyscalculia are very aware of their struggles and unfortunately can develop anxiety and stress, due to the intense concentration they must use to complete tasks and frustration they feel because of their lack of understanding throughout their learning experiences. Moreover, children can be filled with embarrassment due to their learning difficulties, which can decrease their confidence and overall have a negative impact on their wellbeing. This may become obvious to teachers, when children are regularly avoiding maths related tasks, sometimes manifesting into negative behaviour in the classroom and subsequently limiting their educational opportunities going forward (Ferrie, 2022).

Diagnosing dyscalculia.

Diagnosis varies slightly depending on local educational authority. However, within Wales, a dyscalculia diagnosis within a school setting, is achieved by an four step process carried out by either educational psychologists, a designated ALN coordinator within the school or by a specialist teacher who is trained in additional learning needs (Snap Cymru, 2024). The first step is an initial screening, where observations, standard testing results and teacher reports are collated, and teachers can draw their conclusions and refer up. Following a referral, the next step is assessment. Children undergo a specific assessment, which could include mathematical reasoning and cognitive tests. This assessment determines a diagnosis. Early diagnosis is vital for allowing the implementation of helpful and targeted interventions. Furthermore, in accordance with The Additional Learning Needs Code for Wales 2021, educators are expected to make accommodations in their planning and make adjustments to their teaching strategies, to ensure their provision is inclusive for supporting all learning needs (Welsh Government, 2021).

Support required for children with dyscalculia.

Once a child receives a dyscalculia diagnoses, under the Additional Learning Needs and Education Tribunal (Wales) Act 2018, educators and related specialists can create an Individual Development Plan (IDP) which is a statutory document that is tailored specifically to the individual child and their needs. Their IDP outlines their targets and areas of necessary learning accommodations required (Welsh Government, 2018).

Adapting learning environments for children with dyscalculia involves implementing various strategies to support their unique needs. Children need multi sensory techniques for learning, tactile and visual aids are vital in order for children to understand mathematical concepts (Maapola-Thobejane and Maguvhe, 2022). Due to their high anxiety levels, children with dyscalculia require a calm and supportive working environment when undertaking mathematics tasks. Children should have extra allowances of time in order to complete activities and a reduced workload compared to children who do not have dyscalculia. In order to build children's confidence and reduce their anxiety levels, educators should have a positive attitude, using praise and rewards for the child's efforts (Fox, Lavery and Chowdhury, 2019). When planning maths tasks, educators need to include helpful tools and resources to aid completion of tasks, such as manipulatives like blocks and counting bears, to make abstract concepts more tangible and concrete. Children also benefit from real life context maths problems, which are more relevant for children and therefore easier to understand. Furthermore, research has discussed the benefits of using technology such as iPads for engaging numeracy games. By using a familiar technology tool, maths learning becomes less intimidating for children with dyscalculia (Rakich, 2023).

In conclusion...

Dyscalculia is a complex condition and goes beyond the classroom. An in depth understanding of dyscalculia and its impact on children's learning, development and holistic wellbeing, is essential for educators, families and the wider community to be able to effectively implement support for children in their diagnoses. Furthermore, by identifying the challenges those children face and implementing strategies to enhance their learning, they will go on to develop confidence and grow in their self-esteem, ensuring they have the skills to feel capable of succeeding in their school education, future career and general daily life. In contrast, research for dyscalculia is arguably still in it's infancy (Kwok, 2023). Arguably, in order for educators and families to adequately support their children with a dyscalculia diagnoses, further research needs to be undertaken.

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