

Children's under-achievement could be down to poor working memory

Children who under-achieve at school may just have poor working memory rather than low intelligence according to researchers who have produced the world's first tool to assess memory capacity in the classroom.

The researchers from Durham University, who surveyed over three thousand children, found that ten per cent of school children across all age ranges suffer from poor working memory seriously affecting their learning. Nationally, this equates to almost half a million children in primary education alone being affected.

However, the researchers identified that poor working memory is rarely identified by teachers, who often describe children with this problem as inattentive or as having lower levels of intelligence.

The new tool, a combination of a checklist and computer programme informed by several years of concentrated research into poor working memory in children, will for the first time enable teachers to identify and assess children's memory capacity in the classroom from as early as four years old.

The researchers believe this early assessment of children will enable teachers to adopt new approaches to teaching, thus helping to address the problem of under-achievement in schools.

Without appropriate intervention, poor working memory in children, which is thought to be genetic, can affect long-term academic success into adulthood and prevent children from achieving their potential, say the academics.

Although the tools have already been piloted successfully in 35 schools across the UK and have now been translated into ten foreign languages, this is the first time they are widely available.

Working memory is the ability to hold information in your head and manipulate it mentally. You use this mental workspace when adding up two numbers spoken to you by someone else without being able to use pen and paper or a calculator. Children at school need this memory on a daily basis for a variety of tasks such as following teachers' instructions or remembering sentences they have been asked to write down.

Lead researcher Dr Tracy Alloway from Durham University's School of Education, who, with colleagues, has published widely on the subject, explains further: "Working memory is a bit like a mental jotting pad and how good this is in someone will either ease their path to learning or seriously prevent them from learning.

"From the various large-scale studies we have done, we believe the only way children with poor working memory can go onto achieving academic success is by teaching them how to learn despite their smaller capacity to store information mentally.

"Currently, children are not identified and assessed for working memory within a classroom setting. Early identification of these children will be a major step towards addressing under-achievement. It will mean teachers can adapt their methods to help the children's learning before they fall too far behind their peers."

The checklist, called the Working Memory Rating Scale (WMRS), will enable teachers to identify children who they think may have a problem with working memory without immediately subjecting them to a test. A high score on this checklist shows that a child is likely to have working memory problems that will affect their academic progress.

If the teacher feels significantly concerned about a child's performance in class, he or she can then get the child to do the computerised Automated Working Memory Assessment (AWMA). The tools also suggest ways for teachers to manage the children's working memory loads which will minimise the chances of children failing to complete tasks. Recommendations include repetition of instructions, talking in simple short sentences and breaking down tasks into smaller chunks of information.

Both tools are published by Pearson Assessment. The research that provided the foundation for the AWMA was funded by the Economic and Social Research Council and the British Academy.

Case study - Head teacher from Lakes Primary School in Redcar, Cleveland

Lakes Primary School has been working with Dr Alloway in learning how to identify poor working memory using the new tools. A number of teachers have been trained to screen the children for working memory.

Head teacher Chris Evans said: "Dr Alloway's research into working memory really caught my interest as I could readily recognise how some children at Lakes School may well suffer from poor working memory. With some of the staff now trained to identify problems, we have the knowledge and tools to carry out a proper assessment and have the skills to help these children be more successful in school.

"We are already beginning to see children in a different light knowing more about the difficulties faced by children with impaired working memory. We realise that they are not daydreamers, inattentive or underachieving, but children who simply need a different approach. We think these new ways of learning can help both the teacher and the children to successfully complete their work."

When do we use working memory in everyday life?

- Multiplying together two numbers such as 43 and 27 spoken to you by another person without being able to use a pen and paper or calculator.
- Remembering a new telephone number, PIN number, web address or vehicle registration number.
- Following spoken directions such as go straight over at the roundabout, take the second left and the building is on the right opposite the church.
- Remembering the unfamiliar foreign name of a person who has just been introduced to you for long enough to enable you to introduce them to someone else.
- Measuring and combining the correct amounts of ingredients (rub in 50g of margarine and 100g of flour, and then add 75g of sugar) when you have just read the recipe but are no longer looking at the page.

Source: Durham University

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