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Practically Speaking

ADHD IN THE CLASSROOM

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Around 5 to 9% of children in Australia have attention deficit/hyperactivity disorder (ADHD). They are likely to be overactive, impulsive, inattentive, or distractible. They may also have problems in social and adaptive behaviour, and mental health problems such as depression, anxiety, or conduct disorder. Many children with ADHD also have a learning disability and almost all suffer from academic underachievement. This article will give teachers a brief overview of the problems experienced by students with ADHD and make suggestions for supporting these students in schools.

ADHD is a genetic disorder that affects the areas of the prefrontal cortex and related circuits in the basal ganglia and cerebellum. ADHD tends to run in families. It affects a number of areas in the brain, including the prefrontal cortex. This part of the cortex lies behind the forehead and its functions include working memory, language, impulse control, problem-solving, and planning. Many experts now believe that at the core of the disorder is a developmental delay in *behavioural inhibition.* Behavioural inhibition refers to the ability humans possess to put a pause between an event they experience and the response they make. For example, most of us are able to stop ourselves from lashing out or running away when someone annoys us. Behavioural inhibition is thought important for development of what neuropsychologists call the executive functions (skills). The executive skills allow humans to guide and plan behaviour. In students with ADHD this ability to pause and plan behaviour is impaired, which may lead to the following delays:

1. *Reduced verbal and non-verbal working memory capacity.* Poor working memory leads to poor hindsight and forethought. Children with ADHD therefore do not learn as well from previous behaviour or from previous consequences. They find it more difficult to plan future behaviour. The ability to monitor task performance and to make changes in response to error or feedback is also delayed.

   Reduced working memory capacity also affects the child's sense of time. They have difficulty planning behaviour across time and using time to manage task performance.

Children who fail to consider time and the future before acting show less goal directed behaviour, particularly for long-term goals. They are also more likely to be motivated by smaller, shorter, more immediate goals.

Working memory delays may also make the child with ADHD less able to utilise internally represented information such as rules, teacher or parent expectations, and social rules to guide behaviour. The ability to hold information in mind in both verbal and non-verbal form may also affect reading comprehension. The ability to process and code information in a coherent form may also be affected. Hence, children with ADHD can be observed clinically to have difficulty accessing information and concepts at critical times.

2. *Reduced self-regulation of emotion/motivation.* Children with ADHD experience the same emotions as other individuals. However, they have more difficulty inhibiting the external expression of those emotions. In other words, they are less emotionally inhibited. The ability to regulate emotion also affects the ability to create the appropriate level of arousal for task performance and the ability to create and sustain motivation. Motivation provides the persistence required to continue with tasks and goals in the absence of immediate reinforcement. Children with ADHD are therefore more dependant upon external reinforcement to influence and drive behaviour.

3. *Poor planning and problem-solving.* Effective problem-solving requires the individual to be able to hold and manipulate information in working memory, to form and to test hypotheses and to evaluate possible solutions, to monitor ongoing task performance, and to modify strategies where necessary. These planning and problem-solving skills may also be important for critical thinking. They allow the individual to evaluate competing information, to generate response options, and to evaluate likely consequences for long-term benefits. These abilities, which students with ADHD find difficult, are important for social problem-solving as well as academic achievement.

Implications for classroom management

Given the obvious importance of the executive skills for learning and performing basic academic skills such as reading comprehension and arithmetic, in addition to their importance for higher level problem-solving behaviours and for regulating behaviour and emotion, it is unsurprising that many students with ADHD experience difficulties within the curriculum. However, it is important for educators to recognise students with ADHD

can behave appropriately and learn adequately within a supportive environment that recognises and compensates for their unique difficulties. It is also important to recognise that the characteristics or features of ADHD exist on a continuum. In other words, there will be some students who display many features and who will find academic work very challenging. There will also be a number of children who are more able to problem-solve and manage their own behaviour. However, between these poles will be a large group of students with varying degrees of focus and self-regulatory behaviour. The following strategies will therefore be useful for many children in the classroom.

Addressing delays in sense of time. In terms of modifying classroom behaviour, educators must take steps to minimise the time delay between behaviour and consequences. The most effective programs are those that are implemented at the point of performance or immediately thereafter. Delayed reinforcement or punishment runs the risk of being ineffective because the student cannot establish the link between action and consequence. They will therefore be less able to use this information to regulate behaviour at another time.

The student's ability to use time as a vehicle for planning behaviour will also adversely affect the ability to complete long-term projects. Given a homework project to complete in two weeks' time, the student with ADHD will not begin until it is absolutely imperative to do so, and sometimes even later! The problem in using time can be illustrated by the following analogy. A typical child fishing in the middle of a harbour, when told that in fifteen minutes a supertanker will cross their path, will consider the following: *where will I be safe, how long will it take to get there, how long will it take to get organised to leave, and therefore how much more fishing can I do?* In contrast, the student with ADHD will listen to the warning and most probably recognise the danger. However, chances are that they will not plan how and when they will have to move. They will only be motivated to act when that supertanker looms large in their immediate world.

To help the student with ADHD achieve longer term goals, it is essential that educators help them break assignments and projects into smaller components with their own separate timetables and rewards. It is good practice to include the student's parents in the planning and execution of longer term tasks, as at least some project work will need to take place within the home.

Make information and rules external to assist with behavioural regulation. Students with ADHD are less able to use internal information to regulate behaviour. Class rules, expectations for behaviour, and task instructions must therefore be presented externally

(visually) where possible. The need to refer to and use these rules must be reinforced on a regular basis. Examples within the classroom include posters with class rules, task steps, or expectations on the whiteboard, and chore or task cards that can be placed on the child's desk.

Not only do rules and expectations have to be made external, but so does motivation. Remember that students with ADHD find it more difficult to regulate the appropriate level of arousal for task performance and have less internal motivation. Put another way, the student with ADHD may not do something just because it is the right thing to do or because they know it will make the teacher happy. The use of external reinforcers will be necessary.

Many educators successfully employ a simple token or point system to support class rules. Make a list of privileges and assign each a point or token value. Then make a list of desired and/or undesirable behaviours and assign each a token/point value. Do not forget to make the lists external (write them down and display them in an obvious place in the classroom) and draw attention to them regularly. Tokens or points can be awarded for successful task/behavioural performance or removed when an undesirable behaviour is performed. At the end of the day, the student is able to "*purchase*" a privilege. Greater detail on the process of implementing a structured token/points system within the classroom can be found in Barkley (1997).

In addition to providing a means of motivating the student externally, a token/points system has several other advantages. Firstly, it encourages the educator to pay attention to the child's positive behaviour. This can even up the balance between negative and positive teacher–student interactions. There is also greater chance that the student will learn what to do, rather than what not to do. Secondly, by providing a simple method of administering consequences for behaviour, it ensures that the time delay between consequence and behaviour is minimal. Finally, a token/points system can assist in teaching the student a fundamental social skill: the notion of fair recompense for fair performance.

Reading comprehension. Because disinhibition interferes with working memory, children with ADHD frequently have difficulty processing and understanding text while engaged in word-reading. Some students report clinically that they forget what they have read at the top of the page when they reach lower portions of the page. In severe cases, students even report difficulty recalling information within single sentences. They often retain only the most concrete and explicit details of a text, and have difficulty recalling more complex and sequential aspects of the plot. Temporal errors are also evident in their recall of plot and detail.

The key to supporting the student's comprehension skills may be to, at least initially, highlight the meaningful information in a text. Ask direct and explicit questions about the text while the child reads. Encourage students to stop word-reading regularly to check for understanding and to establish sequence and meaning. Previewing the text prior to reading can also help identify themes and important points. Quality literature is usually predictable in that the main idea of each paragraph is introduced in a topic sentence. The remaining text in the paragraph is, by necessity, detail supporting the main idea. Teaching students how to deconstruct texts to identify main ideas and the framework used by the author can be a powerful tool for children with ADHD. If they know the main ideas prior to reading they can use what is left of their working memory capacity to fill in details.

Students with ADHD and all students with working memory problems should be taught to become active readers. They should make liberal use of strategies such as highlighting key words or phrases, underlining, writing notes in the margins, and making ongoing summaries. The use of a dictaphone can make the process of constructing summaries more time and energy efficient.

Reduce distractions. For most students, the more stimulation in a classroom the better. For a student with ADHD, who is far less able to resist distraction, posters, collages, mobiles, exciting bookcases, toys and the like are simply distractions. Anticipate the behaviour; remove the distractions. If the student does get distracted, remember that those with ADHD may have more difficulty re-engaging with a task. It is usually worthwhile to reiterate instructions and go over plans and strategies again following off-task behaviour.

Difficulties in changing strategies. Although not completely supported by research, some students with ADHD are observed to have difficulty changing strategies during a task. For example, if a student begins a series of math problems using addition, they may apply the same strategy to subsequent problems requiring subtraction—or at least it will take longer for them to solve the subtraction problem. Similarly, when reading a sequence of words with the same rime (*cat, fat, sat, mat*), they tend to get used to decoding the onset and adding the familiar rime /*at*/. They will often then apply the same strategy to other words in the sequence requiring a different set (e.g., *set* is read as *sat*). Once the set is broken, these students also appear to find it difficult to reapply the onset-rime reading strategy to the next word in the sequence containing the rime /*at*/. Educators may consider modifying tasks so that the requirement for changing strategies is minimised; however, this should be applied on a case-by-case basis, not as a blanket strategy for all students with ADHD.

Examples of task modifications include presenting word-reading and word-spelling tasks in onset-rime groups (word families) and arithmetic tasks in single operation sections.

Difficulties in planning. The suggestions provided above relate logically to the difficulties students have that are associated with working memory and self-regulation of emotion and motivation. Strategies to support the development of planning skills are harder to determine. The following are some suggestions.

When faced with a difficult problem, an adult often takes information that may otherwise be represented internally and makes it external. They will draw diagrams or pictures, they talk audibly to themselves while solving the problem, or they may use a scratch pad for doodling, to make notes, or to perform calculations. When overwhelmed many of us make written lists and many creative industries encourage verbal and visual discussions about processes and ideas. Educators may assist students with planning deficits by helping them explicitly deconstruct tasks and assisting them to break complex tasks into smaller steps. Discussions within the classroom about how each student plans to complete a task can be useful, as can student–teacher discussion about specific tasks. When a student with ADHD fails, the inevitable student–teacher discussion may be more fruitful if focused on what went astray in the *process* rather than in the *outcome*.

In summary, ADHD is a common disorder of childhood that leads to problems with behavioural inhibition and associated deficits in planning and organisation, perception of time, use of internally represented information to guide behaviour, working memory, and internal motivation. The key to helping these students achieve their best lies in understanding how ADHD affects students, and to use ongoing environmental modifications such as those outlined above to modify behaviour.

Recommended readings

Barkley, R. A. (1997). *Defiant children: A clinician's manual for assessment and parent training* (2nd ed.). New York: Guilford Press.

Barkley, R. A. (2006). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (3rd ed., pp. 122–184). New York: Guilford Press.