

FIVE THINGS PARENTS NEED TO KNOW ABOUT THE TEENAGE BRAIN

INTRODUCTION

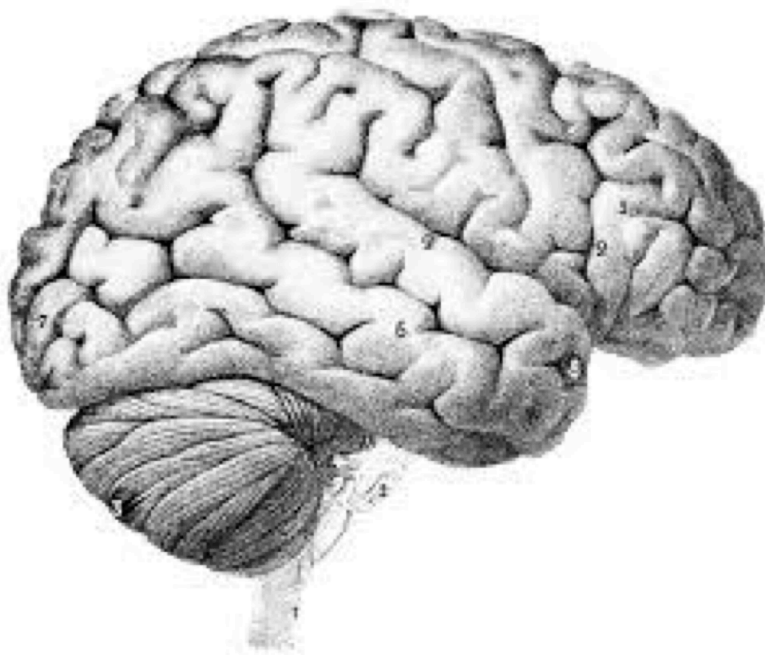
What most students learn about study skills is of little long-term value.

Students usually receive a lot of practical advice about matters as trivial as the suggested height of their chair, the organisation of their desk, the strength of the lighting and the proposed length of the study period. There is obviously some value in this information, but it scarcely scratches the surface.

Another common area of focus is the skills-based approach. Students get taught mind-maps, learning styles and memory tricks amongst other things. Once again, important information but lacking the necessary depth.

The secret to long term, significant improvements in study habits lies in knowledge of the brain and how it works. Attempting to become a better learner without focusing on the brain is a little like a mechanic trying to fix a car without looking at the engine.

This guide contains essential information for parents to help children through their sometimes turbulent studies. The insights on the teenage brain will provide broad scientific guidelines for you to consider, while helping your child with his or her individual challenges.



POINT 1 –YOUR CHILD’S MINDSET MATTERS

Before your child even opens a book to study, his or her mindset will play an important role in their NCEA results.

When we talk about mindset, we are not talking about how enthusiastic or reluctant your child is in regard to schoolwork. We are talking about mindset as defined by the American academic Carol Dweck. She identifies two primary mindsets: fixed and growth.

Students with fixed mindsets believe that their intelligence is set and can never be changed in any meaningful way. High achievers with a fixed mindset constantly need to prove themselves. They show more interest in results than in learning, avoid risks at all costs and feel that feedback is disguised criticism. Most importantly they are very negatively affected by any sense of failure. Underachievers with a fixed mindset see no real point in trying because they don't believe they can improve. These students lack motivation, don't put in much effort and give up easily when faced with obstacles. They feel, either consciously or unconsciously, that nothing will ever change, so why bother trying.

In contrast, those with a growth mindset focus on improving, rather than worrying about how 'smart' or 'dumb' they consider themselves to be. They believe that their current achievement levels are just a starting point and that with hard work and perseverance significant progress is possible. Obstacles are seen as challenges and feedback is welcomed as a way of bringing about change.

"Students who embrace growth mindsets—the belief that they can learn more or become smarter if they work hard and persevere—may learn more, learn it more quickly, and view challenges and failures as opportunities to improve their learning and skills."

Carol Dweck

The fixed mindset becomes a self-fulfilling prophecy. Limited progress is made by the individual not because they are not smart enough but because of their belief system. Parents of children with a fixed mindset will find that their praise and reassurances are often dismissed. Support from teachers is often ignored. What, as parents, do you do under these circumstances?

If you feel that your child may err towards a fixed mindset, feel reassured by the fact that you don't have to *convince* your child that he or she is a strong academic. All that is needed is for them to become open to the *possibility* that their intelligence is not fixed. Fortunately science offers us proof that progress is possible. Once your child has an understanding of the physical changes that take place in the brain when learning occurs, they often develop a more open mind to new possibilities. (See point 2)

Dweck also reminds us to praise our children for their *efforts* not their *results*. She believes that too much emphasis on outcomes can encourage a fixed mindset.

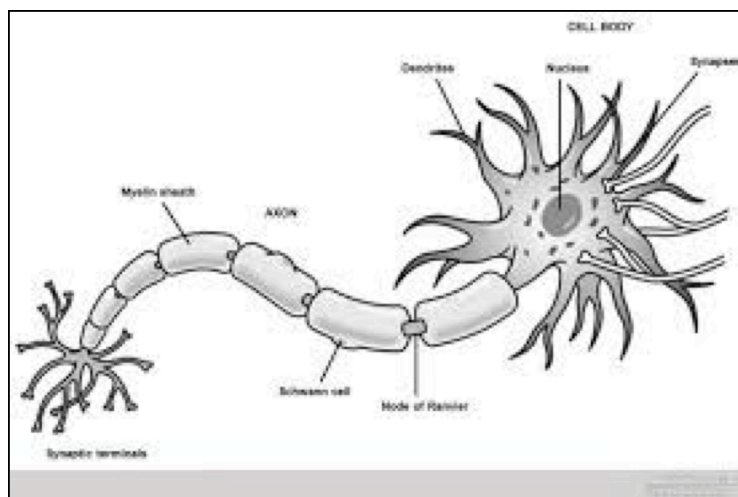
POINT 2 – TEACH YOUR CHILD THAT LEARNING IS A PHYSICAL PROCESS

Until relatively recently, no-one was sure what happened within our brains when learning took place. There is still a great deal of mystery around the process, but what we do now know is that learning involves *physical changes* to the structure of our brain.

Learning is facilitated by brain cells or neurons. Neurons consist of a long cell body called an axon, at either end of which branch-like extensions or dendrites are found. Neurons form connections with one another through the dendrites, and it is along these connected neurons that messages are passed through chemical and electrical processes. These messages, speeding along our brain networks constitute our thoughts, memories, ideas and inspirations.

So what happens when we learn? Neurons and their dendrites actually sway, shift or grow in order to form new connections with other neurons. In other words, learning is a physical process that results in actual changes to the brain structure.

This is an important fact for your children to grasp. Learning should no longer be seen as an abstract process in which knowledge just slips into the minds of the lucky few who have good brains. It is a physical process open to all those willing to invest time and effort in its pursuit.



POINT 3 – YOUR TEENAGE CHILD IS AT A CRITICAL PHASE OF BRAIN DEVELOPMENT

Adolescence is often defined in terms of the external physical changes that are experienced, but the internal changes are every bit as significant.

Major changes are currently taking place in the architecture of your child's brain. Most importantly, the changes can be influenced by him or her and will have ramifications on the rest of their lives.

Teenagers have considerably more brain cells or neurons than adults. During the teenage years the number of brain cells and connections will be significantly reduced. This process is called 'pruning'. Experience will determine which neural circuits will be pruned away based on a 'use it or lose it' principle. The less likely a person uses a circuit, the more likely it is to be culled during adolescence. The changes result in a more specialised and more effective brain.

What is the significance of neuron 'pruning'? Many areas of the brain are specialized to perform specific functions. Neural pathways that will be useful to your child in the future are worthy of preservation through current regular usage.

All is not lost if your child does not make the most of this critical period. Neurons will always be able to form new connections, new brain cells can be formed throughout one's lifetime and specialised brain areas can take over the responsibilities of those of other regions. The fact remains however that your son or daughter will never be able to influence the structure of their brain to quite the same extent as they can in the next few years. This is something that all teenagers need to know.



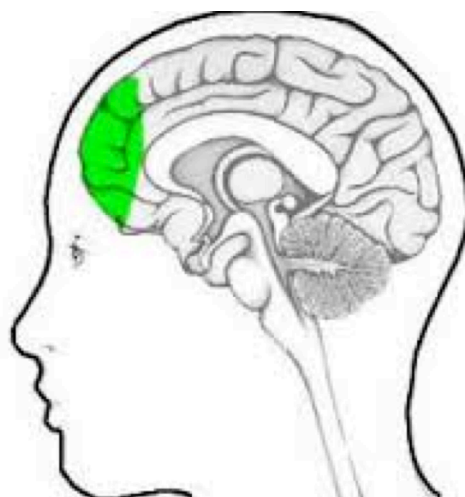
POINT 4 – THE PLANNING PART OF THE TEENAGE BRAIN IS NOT YET FULLY DEVELOPED

Not only are there important architectural changes taking place in the teenage brain but there is also a part of your child's brain that has not yet fully formed. The area that is still in the process of maturation is the pre-frontal cortex housed behind the forehead area. Amongst other responsibilities, this area is tasked with planning, integrating ideas, making decisions and inhibiting behaviour. This area of the brain will only be fully developed in the early twenties – around the time that your son or daughter is busy with tertiary studies.

This fact explains why so many young people find it difficult to plan their exam studies effectively. Your child probably needs more help from you in this area than others – though they will never admit it. Try and subtly involve yourself in the planning process and help your child come up with a realistic and achievable study programme. The aim is to scaffold your intervention. Give them as much help as possible at the beginning, focusing a lot on the principles of good planning, and as your child becomes more effective, you can withdraw support slowly.

Getting involved in your child's study programme is often difficult, as teenagers will insist that they 'have things under control'. Perhaps suggest a trade-off. Suggest that if you are able to help with the planning, you promise to back off more when they are in the studying phase. You will know what tactic will work best with your child.

There is an important aside to this point about the maturation of the pre-frontal cortex that is worthy of mention as it is of more importance than your child's learning. It has to do with their safety. Teenagers have increased levels of dopamine in their brains. Dopamine is the 'feel good' hormone that drives much of their behaviour. Dopamine can lead to thrill-seeking and risky behaviour that we often associate with adolescence and early adulthood. The spike in dopamine levels and the under-developed pre-frontal cortex, which cannot assess risk as effectively as it will in later years, makes this a particularly vulnerable period in the life of a young person. When teenagers make decisions, they are often likely to err on the side of risk. If they understand this they may be able to recalibrate their decision-making process in the knowledge that their brain has a natural, and potentially dangerous bias.



POINT 5 – FOCUS ON HABITS NOT TASKS

Habits are formed by the regular use of particular brain circuits. The more a circuit is used, the stronger it becomes, in exactly the same way that ongoing exercise will build more powerful muscles. Your child's approach to learning will involve a series of habitual behaviours, both good and bad. A period of procrastination may regularly precede a study session for example. It is far more effective to focus on your child's habits than it is on a particular work task. The former involves long-term change while the latter is transitory. Without sounding as if you are nagging, point out to your child that he or she is procrastinating (or avoiding, giving up, losing focus etc.) and suggest ways in which they can overcome the bad habit. It may be best to approach them at a point at which they are not studying, and the mood is relaxed.



CONCLUSION

This is an exciting time to be a teenage student. More information is available now on the workings of the brain than in any time in history. The more we know, the more effective learners will become. This information represents the tip of the proverbial iceberg. Students should take heart from the knowledge that they have more influence on the development of their brains than previous generations ever thought possible. Adolescents have well over one hundred billion brain cells in each of their brains. There are more connections in their heads, than the total number of connections between all the computers in the world on the Web. Their future looks bright.

John Horrell

John Horrell is the director of Knowledge Shop NZ, an education business that specializes in the teaching of academic English to school-age students as well as Study Skill programmes to all audiences. John has worked within schools as both a teacher and deputy principal. In addition he was involved in teacher training for a number of years as a lecturer. He established Knowledge Shop in 2005 and continues to run the business. He is convinced that a thorough understanding of the brain is necessary for learners in all fields to achieve their potential and is contracted to a number of schools to share his knowledge.

John can be booked for talks or workshops. He speaks to all groups, small and large and can tailor the information to the specific audience. He also consults on a one-to-one basis. For more information please call 478 8000.

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