# Why Do Students Need to Understand their Brains to Help Them Learn?

Continuing with the theme of science and neurobiology in this newsletter, there is further support for the need for students to understand how their brains work in order to help them learn.

People can believe in the myth that our brains are fixed and that we simply don't have the aptitude for certain topics. This type of belief has shown to be scientifically inaccurate and it negatively impacts not only education, but many other events in our everyday lives. The science of neuroplasticity, how our brains change in response to learning, suggests learning can take place at any age so children and adults can benefit from understanding this important message. The concept of a 'growth mind set' (that our minds can continually develop through effort and learning) rather than a fixed mind set (that we are limited to our learning based on our fixed intelligence) is therefore important to foster in children and ourselves as adults.

1. Acknowlege that our brain is capable of changing through learning. Research from neuroscience is pointing in the direction that our brain is always changing. Every time we learn, our brain forms, strengthens or connects neural pathways. So we don't need to be stuck in the belief that we are unable to learn, at any age.

Some research has shown that the students who are divided into reading or maths groups based on ability can end up achieving worse results than students in mixed ability groups. Another piece of research showed that the brain of students labelled as having a learning disability rewired after a short programme of one to one tutoring.

So one message is to encourage ourselves to keep learning, irrespective of age.

**2. Learn to embrace struggle, mistakes, and failure.** Students and teachers may believe that getting the right answer on a test shows that students are learning. However, it is actually when students practise difficult things, problems just beyond their ability, that the brain works harder and imprints new knowledge. This also makes the knowledge more reachable later on.

When students keep practising what they can already do well, it may hinder their learning, whereas making mistakes helps them focus on different ways of considering a problem, which helps strengthen learning. When teachers encourage students to struggle and students give themselves permission to make mistakes, it can be very liberating for both.

**3. Change your beliefs about your mind, and your brain will follow.** When people change their minds about themselves, it seems that this will also change their body and brain. For example, researchers ascertained that adults who had negative ideas about aging in their younger years (between 18 and 49 years old), were more likely to experience a cardiovascular event during the next 38 years, regardless of their initial age, heart health, race, or many other factors.

The same is true for how people think about their learning. For example, if young children learn that their success in school is tied to being clever rather than tied to effort, they may be less motivated to learn later on.

**4. Try multiple approaches to learning.** Multi-dimensional approaches to teaching and learning work best because they engage many areas of the brain at once, and communication between different brain areas assists learning. It seems that learning that is more physical, multidimensional, and creative helps students learn best. For example, some research into how students learn maths showed that challenging students to consider maths problems using different strategies such as story telling or visual art led to much more effective learning. This indicates that that approaching something you want to learn from multiple angles is better than just trying to get it "right."

**5. Aim for flexible thinking rather than speed.** Too often, teachers and learners think that being fast at something means you're good at it. But, as research suggests, that's not always the case. Trying to do something under pressure, such as a timed test, can cause stress, and this can hinder the working memory needed to recall important information.

Some students relish and thrive in timed tests but engaging with material in flexible ways over time is key to learning.

**6. Try collaboration.** It seems that peer support is important to learning as well and so it is important for schools to reinforce the idea that learning together is better than learning alone. When students are learning together, it helps them to understand that other students can also find some tasks or parts of the task difficult and problem-solving is important rather than staying stuck. It also reinforces how learning is a process with obstacles that need to be overcome.

Collaborative learning also prepares students for work life where team work can be a key part of the job.

The above information highlights how obstacles to learning are often more a function of our approach than of our ability. Our minds may be less limited than we think.

*"I like nonsense; it wakes up the brain cells."*

***Dr. Seuss***