The face of education is changing constantly to adapt to a changing world. One of the current challenges is managing the impact technology is having on our students’ learning needs. There are two key considerations for teachers in the 21st century: 1) How does the brain learn? and 2) What impact is technology having on the brain? If we mindfully adapt our teaching practices to address these two considerations, then student achievement, classroom management and student-teacher relationships can improve significantly. This article aims to provide classroom strategies that can be immediately integrated to address student learning needs according to what we know about educational neuroscience and the impact of technology on student concentration.

**Technology, the brain and education**

David A. Sousa, an international consultant in educational neuroscience, states that, "the brain is transforming itself because of its interactions with our technological world" (Sousa 2015, p. 1). Already there are “research findings revealing short-term distinct changes in students’ attention, memory function, thinking processes, and social behavior” as a result of early and regular use of technology (Sousa 2015, p1). While research continues into neuroscience, it is clear that “the brain is intimately involved in and connected with everything educators and students do at school” (Jensen 2008, p. 411). We can (and should) respond to what brain research has provided to implement appropriate strategies to foster a healthy learning environment for our students.

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e-Teaching June 2016 (19) – researched and prepared for ACEL by Katrina A Harte, Science Teacher, Inaburra School, Bangor, NSW

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Student concentration
A student’s capacity to learn is significantly influenced by their ability to concentrate and keep attention. While this has always been the case, “today's students are growing up immersed in a digitally-saturated world which places unprecedented demands on their attention and learning” (Goodwin 2015, p. 1). Studies haven’t found evidence to support the idea that student attention spans are decreasing, however they have found that technology has rewired the brain to become accustomed to task switching due to having multiple demands on their attention all at once (Sousa 2015). A study done by Rosen, Carrier & Cheever (2013) on secondary and tertiary students found that students averaged less than six minutes concentrating on a task before switching to another due to a technological or social media induced distraction.

So the question is, how long can we expect our students to concentrate for? According to Warrick (2013), a student’s attention span is approximately their age in minutes. For example, a 15 year old will have approximately 15 minutes of concentration before their brain needs a break and a 10 year old will have only 10 minutes. Students can’t fight their brain characteristics. This means that some ‘good’ students have the ability to mask their absent concentration without causing disruption to a class while another student’s disengagement can cause classroom management issues. Even if a student appears to be concentrating for a lengthened amount of time, a ‘lull’ or break in concentration has still occurred. Concentration can return on its own, but it is reduced from the initial level of concentration and the brain can be more easily distracted (as shown in Figure 1).

As students have become accustomed to task switching their brains will automatically look for a new task as their attention starts to wane. As educators our challenge is to harness and control when this task switching occurs and coordinate it so that their brain gets a break at the same time. If left uncontrolled by the teacher, in a classroom of 25 students each of these breaks will occur at slightly different times and students will find their own task to switch to. During this time, students will often look toward a technological distraction which can take the brain away from the path leading towards accomplishing the learning objective. If we plan well then we can orchestrate when their brains take the break, when they switch back on again and how that break occurs. This is important for learning because “taking regular breaks keeps students’ attention sharp” (Goodwin 2015, p3). A good break resets the brain to return to almost full concentration and the cycle starts again. Marzano, Pickering & Heflebower (2010) suggest that pre-adolescent change in instruction is needed every 5–10 minutes while adolescents need change every 10–20 minutes. This means that in a 60-minute lesson there should be at least three orchestrated brain breaks for a 15-year-old. The diagrams above represent what is believed to happen when the teacher doesn’t orchestrate a ‘brain break’ intervention (Figure 2) and what happens when they do (Figure 3).

Three strategies outlined below can be effective in maximising student concentration in the classroom and giving students adequate breaks when the teacher desires.

Explicitly communicating the learning objective
For effective concentration the brain needs to be engaged in the learning objective as soon as possible. “The brain’s main task is to keep its owner alive”
to hear their new learning in their own voice. This is also an essential step in ensuring listening to explicit instruction and engage with their new learning. The third practice is to encourage peer-to-peer discussion. By allowing students to discuss their experience. Examples may include:

- Peer teaching: take a small group of students and teach their group.
- Asking students to take 10 steps and find their three things they just learnt.
- Three things they just learnt, one thing they un-learnt and one thing they re-learnt.
- Peer-to-peer discussion can also incorporate movement as students turn in their seats to face each other or are asked to go and find a partner from a different table.

Conclusion
Having an awareness of how the brain functions and what this means for students can easily transform your classroom.