



Leadership Development

Anywhere, Anytime

Practical Tips for School Leaders – #20

June 10, 2020

Excerpt from: “The Sciences of Teaching”, May 2020, *Educational Leadership* written by Carol Ann Tomlinson and David Sousa

Tomlinson and Sousa discuss the connection of neuroscience and education psychology on effective instruction. ‘Only in about the last half-century has the field of psychology begun to inform education practice.’ This knowledge helps teachers design lessons which increase the capacity of students. The study of neuroscience makes us aware of the connection between physiology and psychology and the impact on learning. The connection of educational psychology and neuroscience may help us understand why certain instructional strategies support student learning and others do not.

In their article, Tomlinson and Sousa identify four instructional processes which will boost student learning. The first two strategies in this article emphasize direct instructional processes; strategies teachers can use to increase all student’s thinking and learning capacity. The second two strategies discuss social-emotional skills and the connections of neuroscience and diversity in the classroom.

Growth Mindset and Motivation – The theory of growth mindset (Dweck, 2016) is supported by neuroscience as we know the brain is malleable and develops in capacity over time. People who believe in the growth mindset know that learning is a series of steps taken to gain knowledge. When setbacks occur those with growth mindset persevere. The teacher’s use of specific interventions assists students in learning. Research has “found that even a short intervention that taught students that intellectual abilities can be developed improved lower achieving students’ grades” (Yeager et al, 2019).

The brain responds to the use of corrective feedback, error monitoring and intrinsic motivation processing (Ng, 2018). Researchers theorize that there is a connection between practicing the principle of growth mindset and the development of intrinsic motivation. Educators need to know which instructional methodology to employ to support the learning process and brain development.

Tomlinson and Sousa recommend the following to develop growth mindset in students:

- Explain and teach students the key principles of growth mindset.
- Teach students the skill, attitudes and habits to develop a growth mindset. Hard work must be coupled with smart work.
- Focus the classroom culture on quality work and achievement. Help students learn to identify where they are in the learning cycle and teach them to support their classmates learning.

- Teachers should identify and know their own mindset. Teachers should learn to reflect on their reactions and interactions with students. Ask this question, 'Are you communicating using a growth mindset?'
- Use "plus one teaching", John Hattie (2012), learning to help each student move beyond their point of entry into the lesson/content.

Connecting new knowledge to prior knowledge for all students - When new learning is connected to previous knowledge in original ways the likelihood of students recollecting it significantly increases (Fernandez & Morris, 2018). Research using imaging studies reveal that parts of the brain involved in making connections engages the hippocampus and long-term memory areas used for encoding. The practice of connecting new learning to the student's past experiences increases the likelihood of the student recognizing, applying and remembering new knowledge.

Strategies teachers can use to summon prior knowledge in the classroom include:

- Providing time for students to talk to peers about new learning -- this benefits retention.
- Developing rich and deep relationships with students so the teacher is aware of their interests, their background knowledge and their experiences.
- Taking time to build on each student's background knowledge by adding to what they bring to the classroom. The practice of assuring each student has time to reflect on a previous experience and connect it to new information will support long-term retention.

For reflection:

Do your teachers explain what a growth mindset is and how it may benefit each student?

In your practice, how do you think the convergence of neuroscience and education psychology will affect teaching in the future?

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