Teaching the Way People Learn

Module 1: Examining Neuromyths and the Allure of "Brain-Based" Teaching

This handout accompanies the video for Module 1. Use the handout to review information from the video and to record discussion.

---------- Section 1 ----------

- Neuromyths are misconceptions about how the mind and brain function.
- At times, findings from neuroscience research are over simplified or misinterpreted.
- Teachers are lured by marketers making sensationalized claims.
- Anecdotal evidence may be allowed to overshadow objective data.

Neuro-hit or Neuro-myth?

_____ 1. Listening to Mozart will make your baby smarter.

_____ 2. We are born with all the brain cells we will ever have.

_____ 3. Boys' brains are hardwired to be better at spatial tasks than girls' brains.

_____ 4. If a child does not learn a language before a critical window closes, he or she will never become fluent.

_____ 5. Students learn better when the instructional format, such as visual or kinesthetic, matches their learning style.

_____ 6. A common sign of dyslexia is seeing letters backward.

_____ 7. Cognitive and physical exercises can help integrate the hemispheres of a student's brain.

_____ 8. We use only 10% of our brain, but it's possible to bring more of your brain "online" with cognitive training.

_____ 9. Some people are left-brained; others are right-brained.

_____ 10. Drinking less than eight glasses of water a day causes the brain to dehydrate, impairing learning.

Stop & Jot 1: What neuromyths did you think were true? How might you have come to this information?

---------- **Section 2** ----------

- In considering neuromyths we should be aware of not only why they are incorrect but also how they came to be widely believed.
- The “Mozart effect” applied to one aspect of intelligence. It was a small gain and it lasted only 10-15 minutes.
- The modest finding started to be wildly distorted with the results generalized to children.
- The key to the effect is that you have to enjoy the music being listened to – it’s a stimulant.
- Prior to sophisticated tools, no research could provide evidence of neurogenesis.
- But by the early 1990’s, testing equipment had advanced to show new neurons (brain cells) developing in the adult hippocampus.
- The next step is to figure out whether adults who maintain a youthful-looking hippocampus did something "right" over their lifetime -- whether that's diet, regular exercise, or something cognitively stimulating.
- A new area of research is neurobics, brain exercises that emphasize unexpected stimuli.

Stop & Jot 2**:** Reflect on a time when one of the neuromyths had an impact on you (i.e. did you ever believe that you had all of the brain cells you would ever have?). How did debunking this neuromyth make you feel? What are the implications of this new understanding for your practice?

---------- **Section 3** ----------

- Subtle differences exist between male and female brains, but gender variations in the brain are often exaggerated and misappropriated.
- The science of sex differences has always been – and still is – fraught with controversy.
- Many claims are accompanied by the assertion that observed differences between men and women's brains are “hard-wired.”
- Research has shown that in fact the brain never stops changing. Plasticity is the term generally used to explain how the brain is modified by experiences.
- Although there is evidence of critical or sensitive periods for certain aspects of development, the idea cannot be overgeneralized to all domains.
- In cases in which a critical period can be shown, it appears that the window may narrow somewhat, but only rarely closes.
- Although some kind of specialized critical period for second language acquisition could exist especially in phonology, there is evidence for high ultimate achievement even among late second language learners.

Stop & Jot 3: How might a teacher’s beliefs in neuromyths negatively impact teaching and learning?

---------- **Section 4** ----------

- Recent surveys show that as high as 90% of teachers view learning styles as a way to differentiate lessons thinking that they are helping to meet individual learner needs.
- But in experimental settings, teaching children through their preferred learning style achieved objectives no better or faster than through their nonpreferred modes.
- "Learning style" usually means what students liked (e.g., words or pictures better).
- Willingham says that people have different abilities, not learning styles.
- Rather than focus on styles, teachers should vary their presentations by content or curriculum.
- More benefits are seen when students experience the material in multiple modalities and elaborate on the material to make meaningful connections.

Stop and Jot 4: In your thinking, what is the allure of learning styles? Why is this misconception so widely held among teachers?

---------- **Section 5** ----------

- People with dyslexia struggle to read because they have trouble linking the shapes of printed letters with the sounds of spoken language.
- There are many symptoms of dyslexia, many related to auditory difficulty rather than the visual appearance of the words.
- Brain Gym was intended for children with disabilities but is now marketed as a means of brain enhancement for the general population.
- In 2014, international scientists published letters of consensus against brain games, calling them out for pushing snake oil, more or less.
- There is no significant evidence to suggest that we only use 10% or any other specific or limited percentage of our brains.
- Most of the time, the brain is doing something that is not an observable event, like retrieving a memory or pondering the future.
- The myth of right-brained and left-brained people is rooted in the study of split-brain patients.
- Certain parts of the brain appear responsible for specific functions such as speech or sight.
- But, for more individual personality traits, such as creativity or a tendency toward the rational rather than the intuitive, there has been little or no evidence supporting a residence in one area.
- Unless the corpus callosum has been severed, both sides of the brain are critically involved in most tasks.
- There's no real scientific proof that, for otherwise healthy people, drinking extra water has any health or learning benefits.
- Some studies have found increased water to be associated with better outcomes, but they were correlational studies, not experimental (necessary to suggest a causal relationship).

Go and Grow

Without referring back to the video or handout, what are **three** valuable points you take away from this module?

What are **two** things you would like to do "tomorrow" with the information you learned?

Assignment: What is **one** question you have and would like to research? For the next time you meet, prepare a brief summary of your findings to share with others who may have the same question.