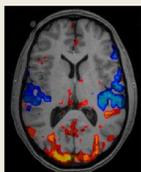


## Neuroscience and Gifted Education

Foundation for Practice, or "Application Gap?"

### Symposium Presenters

Dr. Pamela Clinkenbeard, UW-Whitewater  
 Dr. Curtis Bradley, Bridgewater College  
 Dr. Erin Miller, Bridgewater College  
 Dr. Susan Assouline, U. Iowa/Belin-Blank



WCGTC Biennial World Conference  
 Nashville, TN - July 26, 2019

## Session Topics

- Background and context (PC)
- Foundational concepts (CB)
- Specific differences re: gifted (EM)
- Research with twice-exceptional (SA)
- Q&A/discussion (approx. 20 min.)

## Background

- A long, long time ago... (AERA)
- Proliferation of "brain-based" resources
- Questions of relevance: foundation for practice?
- Roeper Review special issue 2008
- Plasticity: a critical concept for talent development

A rough table of classification for Educational Neuroscience or MBE research

Name or type	Location	Methods	Purpose
Evidence-based teacher research (or ed practice based on research evidence)	Teacher's own classroom/school	Action research, quasi-experimental, other	To try out neuroscience principles in everyday practice
Larger-scale ed & ed psych research, including RCTs (Randomized Control Trials)	PK-12 (US ages 3-18) or university classrooms	Larger-scale behavioral observations or products	To test neuroscience principles in education settings with rigorous methodology
Cognitive science/ psychology; "science of learning"	Psychology labs	Behavioral observations of humans or animals	To test neuroscience principles beyond mapping brain activity
Neuroscience or neuropsychology	Neuroscience labs	More or less direct measures of brain activity (fMRI, EEG, etc.)	To discover new connections & to map neurological evidence & explanations for pedagogical knowns

## Popular Neuromyths

- We use only 10% of our brain.
- Left brain vs. right brain - hemispheric lateralization explains differences in learning.
- Brain development is complete by end of puberty.
- Listening to classical music (or playing Sudoku, or other "brain exercises") increases general cognitive functioning. (What does? Sorry...)

## Roeper Review special issue 2008

Volume 30, Issue 3: The Cognitive Neuroscience of Giftedness (continued in Issue 4)

Guest editor: M. Layne Kalbfleisch

Roeper Review editor: Don Ambrose

### A Few Major Topics from 2008

- We know less than you might think: utility and limitations of neuroimaging studies
- Applications from special populations research
- Physiological definitions of intelligence: location (in brain) and speed (of processing)
- Emerging technologies

### Neuroplasticity and Talent Development

- What is neuroplasticity?
- The brain affects learning, but learning also affects the brain
- Executive functions research
- Conceptual applications to talent development: see *Malleable Minds*



### Five Physiological Preconditions for Optimal Brain Development and Learning\*

- Quality sleep
- Adequate nutrition & low exposure to toxins
- Physical activity/exercise
- Emotional & social well-being & safety
- Cultural well-being and “belongingness”

\*The Aspen Institute

### Possible Discussion Questions

- What have you already heard/read? Parents?
- How detailed is your neuro research news; merit?
- What if fMRI study contradicts teacher experience?
- How do you see interface (ExN) evolving 10 yrs?
- Other; Q&A

### Resources

International Mind, Brain, and Education Society  
<https://www.imbes.org/>

EARLI SIG 22 - Neuroscience and Education  
<https://www.sig22neuroeducation.com/>

Wellcome Trust (UK) - <https://wellcome.ac.uk>

Annenberg Learner site: Neuroscience and the Classroom  
<https://www.learner.org/courses/neuroscience/about/about.html>