

CAN I USE BRAIN RESEARCH IN MY CLASSROOM?

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PURPOSE OF THE PRESENTATION

- As educators, we must adapt how we impart knowledge to allow for student learning so that student “light bulbs” will go off.
- We will highlight some areas about the brain and the learning process that you can use in order to maximize student learning.



FACTS ABOUT THE BRAIN

- **Four major lobes:**
 - Occipital lobe—controls vision
 - Temporal lobes (on sides)—control hearing
 - Frontal lobes—responsible for higher level thinking, developing language, and discussing feelings
 - Parietal lobes—integrate sensory data (i.e. temp)
(Wolfe, 2008)

FPOT—front, middle, back, sides

MORE FACTS ABOUT THE BRAIN

- “Learning is making connections between thousands and thousands of neurons.”
- “Memory is the ability to reactivate a connection made earlier.”
- Students need meaningful experiences so they will be able to remember the next day and reactivate their connections.
- The cortex is the part of the brain that we teach. It controls the ability to be aware of your thinking.

(Understanding the Brain, Wolfe, 2008)

EVEN MORE FACTS ABOUT THE BRAIN

- ◉ An important characteristic of the brain is the ability to forget.
- ◉ Humans are born with enough neurons to speak 6,000 languages. Whatever we do not use, we lose. That is why it is harder for adults to learn new languages.
- ◉ Positive and negative emotions are remembered longer and are good for teaching.

(Understanding the Brain: Wolfe, 2008)

FOUR FINDINGS FROM BRAIN RESEARCH

- ◉ The brain is sculpted from experiences.
 - ◉ The brain seeks meaningful patterns.
 - ◉ Emotion is a catalyst in learning.
 - ◉ There are two types of memory (procedural and declarative).
 - ◉ Procedural memory is in charge of unconscious processes such as breathing and driving.
 - ◉ Declarative memory is what you can discuss and declare such as factual information.
- (Brain Research and Learning, Wolfe, 2008)*

FIVE KEY IDEAS ABOUT THE LEARNING PROCESS

- ⦿ Learning should be student-centered.
- ⦿ We need to understand how people learn.
- ⦿ Brain-based approaches to learning
- ⦿ Factors and Stages for learning
- ⦿ Six Researched Essential Areas in a Classroom

LEARNING SHOULD BE STUDENT-CENTERED

- According to a lifelong educator, Dr. Barry Beers, “Current trends in teaching focus more on how *much* students can learn than on how *best* they can learn” (2006).
- Know how each student learns (visual, auditory, kinesthetic) & meet their needs.
- Howard Gardner shows us that there are several ways in which people learn: verbal-linguistic, logical-mathematical, visual-spatial, body-kinesthetic, musical, interpersonal, intrapersonal, naturalistic (Beers, 2006, 12).

HOW PEOPLE LEARN

- ◉ Concrete Perceivers—learn by doing
- ◉ Abstract Perceivers—learn by observing
- ◉ Active Processors—learn by using information as they experience it
- ◉ Reflective Processors—learn by thinking about information before using it (Beers, 2006)

BRAIN-BASED APPROACHES TO LEARNING

- “Learning should be personal.... Students must use their knowledge to synthesize the appropriate response...They must think” (Beers, 2006).
- “The ultimate goal of schooling is to help students transfer what they have learned in school to the everyday settings of home, community, and workplace” (Beers, 2006).
- “Mere repetition does not keep information in our memory as long as adding meaning to it does” (Beers, 2006).
- Creating a challenging environment benefits most learners, not just gifted learners because they are learning to problem-solve...a life skill.

FACTORS AND STAGES FOR LEARNING

◉ *Factors for Learning*

- *belief systems
- *knowledge
- *problem-solving skills and strategies
- *goals
- *interests

◉ *Stages for Learning*

- *Acclimation (beginning)
- *Competence
- *Expertise

*Find a balance
-Relationship
Between Teaching
and Learning
(Alexander, 2008)*

Factors and stages are the same for teaching and for learning!

RESEARCHED ESSENTIAL AREAS IN A CLASSROOM

- Knowledge Base
- Strategic Processing/Metacognition - Multisensory - Thinking/Writing about thinking
- Motivation and Affect - Emotions
- Development and Individual Differences - Differentiated, Special needs are met
- Situation and Context - Safe environments, Trial and Error Learning
- Standards and Assessment

(Learner-Centered Principles, Alexander, 2008; Using Brain-Based Teaching, Schiller & Willis, 2008; 6 Quick Brain Based Teaching Strategies, Jensen, 2010)

WHAT YOU CAN DO WITH THIS INFORMATION IN YOUR CLASS

- ◉ First, recognize that student brains need you to make sure that you are conscious of how they learn. Your job is not just teaching, it is making sure that the students are learning.
- ◉ Second, make sure that you know your students...how do they learn, what is their learning style, what are their interests? You may use conferences, writing assignments, surveys, or questionnaires to help find out this information.
- ◉ Make sure to make your teaching relevant for the students (so they make connections) and challenging.
- ◉ Provide real-life and simulated experiences for your students to solve problems while investigating content.
- ◉ Allow students to close out their learning to solidify the new knowledge. For example, have them discuss, write, share, teach in order to demonstrate that they understand and to help the information stay with them.
- ◉ Share with other teachers in your professional learning community!

PARTICIPANTS SOLVE AQUARIUM PROBLEM

1. Aquarium Video - www.thefutureschannel.com
2. Present Aquarium Problem
3. Solve Aquarium Problem with Partner
4. Discussion of connections to Brain Research



STUDENT RESULTS FROM BRAIN BASED EXPERIENCE

- 8 students comprehended and completed the task accurately and efficiently with no teacher input
- 10 students received support to with counting accurately, showing work, or comprehending perimeter to eventually understand and solve

Only 2 students struggled to comprehend the problem and counting the larger number even with teacher input

Class Composition = 7 students with learning disabilities

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