Accelerated Learning

Course Outline

Course Description
The purpose of this course is to make the advances in the field of brain research more accessible to educators. The techniques and strategies of Accelerated Learning will accelerate learning across the curriculum and improve student curiosity and satisfaction with the learning process. Beginning with the neurons, the building blocks of the brain, the focus will be on identifying, assessing and connecting connections between those neurons (neuronal networks). If educators engage pre-existing neuronal networks in different areas of the brain, then learning is accelerated faster than through traditional lecture or even hands-on instruction alone (Zull, 2002).

The Accelerated Learning course will help educators assess the overall classroom environment and possible roadblocks to the cortex from subtle or overt "fight or flight" responses (Jones, 2000). The course offers insight into the relationship of sensory input and memory including emphasis on the core information the brain receives from the eyes, ears and touch (Wolfe, 2001).

This course examines the unique relationship between the body and the brain (Hart, 1998), and between students and teachers. It does not represent a new or brain-based curriculum. This course is based on current brain research and emphasizes and creates opportunities for a balanced approach between traditional teaching approaches and new approaches. A working knowledge of the brain is essential. This course is not weighted with complex terminology because the course rationale advocates and uses learning built upon existing knowledge and understanding. Students who have completed the Teacher Education Institute's Whole Brain Learning class will benefit from this course; however it is not necessary to have completed WBL to enroll in the Accelerated Learning.

Objectives
- Examine the development of neural networks in the brain as they relate to the learning process
- Assess student's existing neural networks based on understanding and prior knowledge
- Examine how the "fight or flight" response affects students and teachers and the overall classroom environment
- Identify the physical basis of learning and the mind-body connection
- Describe methods that create opportunities for non-conscious learning in the classroom
- Explain the process of how procedural and movement-based memory is stored and retrieved
- Assess the balance between hands-on teaching approaches and the lecture method
- Identify teaching strategies that can build onto existing neural networks
- Assess the composition and function of neurons
- Assess functions of the brain
- Create strategies to positively enhance brain function in the classroom
Assess how areas of the neo cortex impact learning
Create classroom strategies based on assessing how the neo cortex impacts learning
Describe a situation in your classroom where you could employ the Errorless Learning technique
Analyze the impact of the VAK Learning Styles on teaching and learning
Assess how teachers can use knowledge of working memory to positively impact student achievement
Create a lesson for each type of memory
Complete the learning cycle for a specific topic
Create activities for the levels of learning
Design enrichment activities for the classroom
Develop a plan for creating a brain-based learning school

**Curriculum Design & Time Requirements**
Accelerated Learning is a 3 credit graduate level or forty-five hour professional development course taught on weekends or over five full days. There are a series of major brain-based concepts systematically presented by the instructor using the Socratic or Instructional Conversation method. Each concept acts a building block to form a basic understanding that teachers can weave into their own classroom strategies and best practices to accelerate the learning of their students.

**Course Materials**
The required text for this course is *Brain Matters: Translating Research into Classroom Practice* by Patricia Wolfe. The course text begins with brain physiology: neurons and sub-cortical structures, and then examines how neurons communicate. It then describes how the brain encodes (sensory memory), manipulates (working memory) and stores information (long term memory). The text describes applications and brain-compatible teaching strategies from lower elementary to high school by making the curriculum meaningful through problems, projects and simulations. The text explains how the visual and auditory senses enhance learning. The text also provides a toolkit of brain-compatible strategies and a glossary of terms. In addition to the course text, students may receive supplemental material.

**Session Outline**

**Session 1: Brain Imaging, Neurons and Sub-Cortical Structures**

**Contents:**
1. Introduction to Accelerated Learning
2. Paradigm shifts for thinking about education
3. How brain imaging technology works
4. Interpreting brain imaging for educational purposes
5. Exploring neuron, synapse and sub-cortical anatomy
6. Examining myelination and neural plasticity
7. Synaptic pruning: the case for neural networks
8. How neurons communicate within the brain and body
9. How the brain organizes information and implications for teachers
Session 2: Exploring the Central Nervous System (CNS)
Contents:
1. The active testing of new ideas
2. Characteristics of the Spinal Cord and the Brain Stem
3. The seat of power in the brain: The Cerebellum
4. Gateway to the cortex: the thalamus and hypothalamus
5. The brain's alarm system: the amygdala
6. Remembering your immediate past: the hippocampus

Session 3: The Cerebral Cortex
Contents:
1. The visual cortex (the occipital lobes)
2. The auditory and the sensory/motor cortexes (the temporal lobes)
3. The sensory cortex
4. The frontal lobes: the conscious decision-makers
5. The developing sensory cortex
6. The role of the pre-frontal cortex and adolescent brains
7. Left vs. right and front vs. back cortex

Session 4: How Neurons Communicate
Contents:
1. Our neurons have action potential
2. The synapse and neurotransmitters
3. Peptides and the mind-body connection
4. Understanding addiction and the brain
5. Neural networks and prior knowledge
6. How neural networks grow
7. Errorless learning as a means to build upon existing neural networks

Session 5: Making Sense of Sensory Memory
Contents:
1. Introduction to sensory memory
2. Children and ADHD
3. From sensory signals to perception
4. Visual learning strategies
5. Auditory senses and language
6. The kinesthetic of writing
7. Experiential learning and the senses
8. From perception to attention
9. Emotions and attention
10. Emotions and motivation

Session 6: Working Memory
Contents:
1. Introduction to working memory
2. Personal meaning and memory
3. The multi-tasking myth
4. Memory tools part one
5. Memory tools part two
6. Teacher feedback and working memory
7. Working within the limits of short-term memory transfer

Session 7: Long-Term Memory
Contents:
1. Introduction to different types of long term memory
2. The what and how of implicit memory
3. Procedural memory
4. The facts and figures of explicit memory
5. Semantic and episodic memory
6. Lesson Planning using Implicit and Explicit Memory
7. Consolidation and reflection

Session 8: The Levels of Learning
Contents:
1. Concrete experience
2. The physical modality for learning
3. Representational or symbolic learning
4. Language and images
5. Involving students in problem solving
6. Problem solving from the teacher's perspective

Session 9: The Future of Brain-Based Learning and Brain-Friendly Schools
Contents:
1. The future of brain-based learning
2. Brain-based learning and the concept of change
3. Brain-friendly schools
4. Transforming your teaching and your school
5. Review for final exam

Session 10: Final Projects and Final Exams
Contents:
1. Review
2. Final project presentations
3. Final exam
4. Evaluation

Grading

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<td>Classroom Participation</td>
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<td>100 – 93</td>
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<td>In Class Assignments</td>
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<td>92 – 85</td>
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Student Requirements
1. Attend all class sessions for the requisite number of hours (45) and actively participate in all class activities.
2. Written reflections for sessions 2-8 during the course are required. Each reflection must conform to any accepted style manual. Written reflections will be due as follows:
   a. Reflections on sessions two and three and on sessions four and five at the beginning of session six.
   b. Reflections on sessions six, seven and eight at the beginning of session nine.
3. Students are required to put the brain-based strategies and concepts into action and will be required to clearly describe the implementation of three such strategies or concepts into actual classroom scenarios as a part of their final project which is due at the beginning of Session 10.
4. Pass a final exam.

**Student Academic Integrity**
Participants guarantee that all academic class work is original. Any academic dishonesty or plagiarism (to take ideas, writings, etc. from another and offer them as one's own), is a violation of student academic behavior standards as outlined by our partnering colleges and universities and is subject to academic disciplinary action.