Many very interesting and informative research-based articles on the brain and how it processes information through learning have been published during the past several years. I will attempt to condense the information I acquired from one such article on the brain and adult learning.

During the Adult Basic Skills Professional Development Summer Institute at Appalachian State University, my colleague, Yaneta Sanchez-Brown, and I researched and developed a poster board to display the “12 brain/mind learning principles” developed by Geoffrey Caine and Renate N. Caine. Their research and writings focus on how the brain learns naturally and how instructors can provide student instruction utilizing the most current neuroscience of the brain. The “12 brain/mind learning principles” they developed in 1989 have provided the focus for the educational training they provide at their Caine Learning Center in California (www.cainelearning.com).

Caine & Caine purport an “experiential approach to teaching and learning” (Caine and Caine, 2006, p. 53) “in which learners use their own experiences to construct understanding that make sense to them, rather than having understanding delivered to them in already organized form” (Kauchak and Eggen, 1998, p. 184). This constructivist approach espouses that learners gain understanding or attach meaning to new information through past experiences. Learners attach the new information to the past experiences thereby forming a
new neural pathway to a past memory/experience. Being able to attach this new information in a psychophysiological manner will help embed this new knowledge more concretely within the learner’s frontal and prefrontal cortex of the brain. “This area is associated with coordination and synthesis of emotions, thinking, memory, and body or physical movement” (Caine and Caine, 2006, p. 56).

A hindrance to learning can be an unconscious physiological response to a stimulus, such as fear, which can cause the learner’s survival response to overtake the learner’s senses and prohibit any learning to be accomplished. A good example for some learners is test taking. When presented with a test, some students freeze up or cannot remember information they learned in class. The fear and/or anxiety the student experiences physiologically can prohibit the brain from accessing the necessary information to answer the test questions.

Caine and Caine (2006) suggest that the instructor provide an atmosphere/condition within the classroom that provides the learner with a “relaxed alertness” by limiting/removing as much anxiety and fear as possible. Learners who feel safe within the classroom setting will be able to engage in and respond to the learning activities presented. “When students are genuinely interested they are more likely to pay attention, persist longer, and ask relevant questions—if student questions are genuinely welcomed and invited” (Caine and Caine, 2006, p. 59). Thus, it behooves instructors to watch for students who exhibit signs of fear (folded arms protecting the body), avoidance (to save face), and anxiety. Instructors who can utilize unintrusive questioning techniques and
can develop a trusting, honest rapport with students will provide the type of classroom where students feel safe to participate in their own learning process.

With new brain information, instructors can design their learning activities by attaching the new knowledge/skills to the learner’s memory of past experience and utilize the learner’s emotions/memory and physiology to connect the new information to the prior experience/memory actively engaging the student in his/her learning. All of this can happen within a safe environment for students who trust their instructor and feel their instructor values them. “The three essential elements of teaching to engage natural learning” at http://www.cainelearning.com/files/3elementsexpanded.html provides detailed information regarding relaxed alertness, orchestrated immersion in adequate experience, and active processing of experience.

Instructors who provide a safe environment will find that the classroom will be more conducive to learning. This will help set the stage for lessons which attach meaning to student’s previous memories and lead to increased learning.
The Caines’ 12 Principles

Principle #1: All learning engages the physiology. 
Capacity #1: All students have the capacity to comprehend more effectively when involved in experiences that naturally call on the use of their senses and their bodies.

Principle #2: The brain/mind is social. 
Capacity #2: All students have the capacity to comprehend more effectively when their needs for social interactions and relationships are engaged and honored.

Principle #3: The search for meaning is innate. 
Capacity #3: All students have the capacity to comprehend more effectively when their interests, purposes, and ideas are engaged and honored.

Principle #4: The search for meaning occurs through patterning. 
Capacity #4: All students have substantial, unused capacities to perceive and create patterns and to link those new patterns to what they already understand.

Principle #5: Emotions are critical to patterning. 
Capacity #5: All students can comprehend more effectively when appropriate emotions are elicited before, during, and after their experiences with a text.
Principle #6: The brain/mind processes parts and wholes simultaneously.
Capacity #6: All students can comprehend more effectively when details (specific facts and information) are embedded in wholes that they understand such as a real life event, a meaningful story, or a project that they create or witness.

Principle #7: Learning involves both focused attention and peripheral perception.
Capacity #7: All students can comprehend more effectively when their attention is deepened and multiple layers of the context are used to support learning.

Principle #8: Learning is both conscious and unconscious.
Capacity #8: All students can comprehend more effectively when given time to reflect on and process those experiences about which they live and read.

Principle #9: There are at least two approaches to memory.
Capacity #9: All students can comprehend more effectively when immersed in experiences that engage multiple ways to remember.

Principle #10: Learning is developmental.
Capacity #10: All students can comprehend more effectively if individual differences in maturation, development, and prior learning are taken into consideration.

Principle #11: Complex learning is enhanced by challenge and inhibited by threat associated with helplessness and/or fatigue.
Capacity #11: All students can comprehend more effectively in a supportive, empowering, and challenging environment.

Principle #12: Each brain is uniquely organized.
Capacity #12: All students can comprehend more effectively when their unique, individual talents, abilities, and capacities are engaged.
REFERENCES


