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### Janine Kremling TSSA Winter 2012

Janine Kremling

CSUSB, janinekremling@gmail.com

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## **Lilly West 2012 Report Brain-Based Learning**

I went to several sessions on brain-based learning and the use of metacognition on study skills and student learning.

### **Brain-Based Learning**

The keynote and several sessions discussed brain-based learning; that is, how brain research findings are changing our understanding of learning. The main notion was that science needs to be integrated into education because how learning happens influences how teaching happens. We are born to learn. Your brain has more than 100 billion neurons and it will never fill up. Learning is a change in the neuron patterns of the brain and an increase of neuron patterns. In order for the neuron patterns to stay connected you need to practice because permanent connection relies on practice. Learning is the ability to use information after significant periods of use and it is the ability to use the information to solve problems that arise in the context different (if only slightly) from the context in which the information was originally taught. *"It is the one who does the work who does the learning"* (Doyle, 2008).

### ***Our Students Mindset***

Carol Dweck in her book "mindset" talks about how 6<sup>th</sup> graders classify themselves into "growth mindset" or "fixed mindset." A growth mindset refers to the belief that the brain is malleable. Students with a "growth mindset" will do the work and their desire to learn is paramount. Criticism is directed at the current skill level and students know they can improve. A "fixed mindset" refers the belief that intelligence is fixed: "Some people have it and others don't." They don't do the work because they don't think it will make any difference. Students might say: "I have never been good at this, why put in all this effort – I will fail anyways." Try to look smart (I just want the easy classes). Criticism is taken personally. Give feedback that shows direction and provides a strategy. Research suggests that there is no relationship between students' abilities and growth or fixed mindset.

### ***What Enhances Cognitive Performance?***

Research suggests that cognitive performance can be increased by aerobic exercise before the learning occurs. Aerobic exercise promotes synaptic growth which enhances learning by increasing focus, attention, motivation, and patience. It also increases the mood, improves brain health, reduces stress, and enhances long term memory. Cognitive performance can also be improved by meditation because it enhances attention and certain video games. Video games can be effective if they

require motor control, visual search, working memory, and long term memory. These video games can improve cognitive flexibility, visual-spatial skills, motor speed, and tests of memory.

### ***Framing the Context in which Students Learn***

New material must be practiced to promote dendrite growth (Dr. Janet Zardina). The brain needs 7 to 9 hours of sleep to move the learned material into the new memories. Sleep deprivation switches off neurons and no learning will occur. Learning is also inhibited by multitasking. For instance, learning while watching TV slows you down and increases errors by 15%. Another learning inhibiting factor is acute stress. Acute stress activates CRH molecules which disrupted the process by which the brain collects and stores memories.

### ***Memory Formation and Recall***

Our senses work together. Smell enhances recall, but vision trumps all. Oral information in itself is not sufficient because only 10% can be recalled after 72 hours. If the instructor adds a picture 65% of the information can be recalled after 72 hours. Cramming works to hold information for 16-32 hours. For learning to become long term students need to practice over time.

## **Metacognition and Learning**

### ***Study Skills***

The session was about an experiment conducted in a study skills class. The experiment included four groups. The main idea was that some groups read a paper, meet as a group and explain the reading to each other. The second group was instructed to just read the article, a third group was instructed to read the topic sentences, and the fourth group skipped the article. Then the groups switched and each completed each learning method. At the end of the class students were asked to write a reflective short essay on the question: “ What information did you remember and why did you remember it? What learning method worked the best for you (read and explain, read, topic sentences, skip).

## **Dweck’s Mindset**

### ***Experiment: The Impact of Mindset on Analyzing a Text***

Students were given a short survey on “growth versus fixed mindset.” Depending on their survey answers they are put into the “fixed group” or the “growth group.” The “fixed group” reads an article about “growth mindset” and “growth group” reads

about “fixed mindset.” Each group has to prepare a presentation with examples. In their presentation they have to reflect on what they have read and heard. Following they write a five minute reflection essay. They are answering the following questions: What is a subject you think you can’t do well? Why do you believe that? What is a subject you are really good in? Why do you believe that? Refer back to what we read.

### **Learning Approaches**

What can we try out:

- Exploratory: Learning Styles (Felder-Silverman Model)
- Reading (No highlighting, highlighting, annotating)
- Reading Log: Different groups: (cell phones on, music on, computer on, nothing on)
- Discussion: Group 1: Read, Group 2: Read and Write Three Discussion Questions – Fishbowl Activity: Have a discussion within each group, Have a Quiz
- Take the last 5 minutes of the class: Write a summary of your notes, have a quiz; Leave class without writing a summary, have a quiz – Compare learning outcomes

### **Application to My Classes**

I applied what I learned at the conference to my Correctional Theory and Institutions Class.