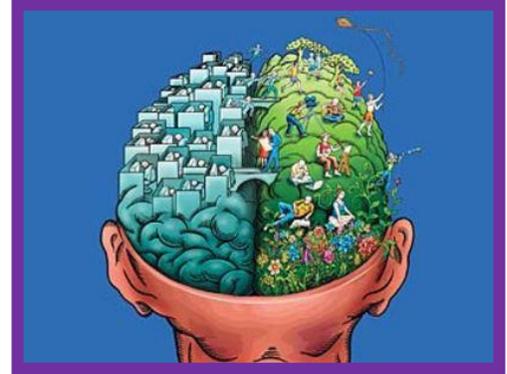


A MENTAL MODEL OF THE LEARNING BRAIN

By Shelley Roy

In the past ten years we have begun to learn more about the brain than we have during the previous 2000 years. New technologies now allow us to explore the brain while it is learning. Robert Sylwester probably says it best: “Our brain is at the edge of understanding itself!” So what does the brain know about learning?



As humans we take information into the brain through our sensory and perceptual systems and begin processing by drawing on memory and problem solving strategies. We eventually translate this into actions. Throughout the process the brain is constantly deciding what information to accept and what information to disregard. The brain is seeking pleasure, excited by novelty and trying to avoid harm. It acts like a giant “Quiz Master”, constantly scanning the environment for answers to questions it has generated and answers it is seeking.

Two of the leading brain researchers, Swylvester and Greenfield., agree that as information enters the brain via our sensory system – vision as electromagnetic energy, hearing and touch as mechanical energy, and taste and smell as chemical energy – it converts the energy into nervous impulses. The impulses travel to extraction and sorting stations, such as the thalamus and the hippocampus, that decide which information to accept and which information to disregard. This decision making process is heavily weighted by emotion. Most information is then sent to the sensory and frontal lobes for further analysis. “A second, quicker pathway also sends any emotionally-laden information from the thalamus to the amygdala, which uses primitive general categorizations of the

limited sensory information it has received to activate an immediate aggressive or defensive response, if the stimulus is sufficiently strong.” (Swylvester, 1995, p.73)

The brain is a parallel processor, which then searches for meaning by patterning. The neocortex is strongly run by these patterns. Jensen (1996) believes this patterning takes two forms, one of matching and one of mismatching. In a matching style the brain seeks sameness and in a mismatching style the brain seeks the differences.

The brain runs on cycles and rhythms. It cannot maintain focused attention for long periods of time. “The day, for our brain, is defined by 16 cycles lasting 90 minutes each. Every 90-100 minutes, your brain is at the strongest left hemisphere dominance and 90 minutes later, it peaks with the right hemisphere dominance. When verbal skills are high, spatial skills are lower.” (Jensen, 1996, p.101)

What does the brain research tell us about a classroom most conducive to learning? Create an environment that is brain-friendly. Caine describes this as an environment of “Relaxed Alertness” (Caine, Caine, and Crowell, 1994, p.206). Relaxed alertness is a state that requires low threat and high challenge, in which the learners’ mental models are well understood by the instructor. Then immerse the learner in multiple, complex interactive experiences which are multi-sensory, multi-modal, continually novel in nature balanced with predictability and routine. Teach using metaphoric stories, and dramas that “provide only the outlines of the story, forcing students to fill in the details.” (Swylvester, 1995, p.85) Conclude by engaging the learners in active processing through testing and reflecting on the experience and metacognitively processing to extract meaning. ***Facilitating learning in this way will solidify and expand new knowledge.***

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