

# Brain-based learning



The brain is a vast hub of neural connections that pass information via electrical discharges. These pathways connect the various parts of our brain and make memory possible. As we encounter new things, the brain struggles to make sense of this information. Information deemed relevant by the brain's control mechanism is processed and stored along a neural connection. Over the course of our lives, experience provides us with new information which is processed simultaneously up from the senses and down from the memory. Since the brain has a finite amount of storage space, it attempts to connect and reconcile new information with previous information. The ultimate result of this process is a blending into general concepts called schema. As we acquire, process, and store more information concerning a specific schema, the neural connection grows and learning takes place (Hardiman, 2003; Huitt, 2003).

While the specifics of the schema-forming process are not yet known, research in language acquisition has shown that humans are genetically predisposed to process information in specific ways. Thus scientists have created several learning theories which attempt to better explain the specifics. One such prevailing theory is the levels of processing theory which says that "learners utilize different levels of elaboration as they process information. This is done on a continuum from perception, through attention, to labeling, and finally, meaning" (Huitt, 2003, p. 1). But what does this mean in the classroom

Educators must realize that students come to them with perceptions about life and school already in place. Skillful teachers will attempt to find out where their students are coming from and what prior knowledge they have before introducing new information. Review activities should be provided so

students with a chance to repeat a specific learning task. A foundation for learning is created as the practiced behavior becomes more automatic and the associated memories come more readily to mind. When new skills are presented, they can be more easily processed when linked to this foundation and when the information is relevant in some way. While education has focused on presenting "real life connections" that strive to include the students' worldviews, relevance is still a matter of individual interpretation that seems linked to the interests of the students. Once an educator creates interest in her students, she has their attention so she can lead them to creating a link between prior knowledge and the new information being presented.

Since learning "requires both the acquisition of information and the ability to retrieve and reconstruct that information whenever necessary" (Hardiman, 2003, p. 53), educators must also devote attention to the retrieval of memories. Another key idea that educators can take from cognitive psychology is that memory involves various parts of the brain. For instance, when learning a song in chorus class one part of the brain may process the melody while another processes the lyrics. Teachers can incorporate this by planning activities that appeal to both brain hemispheres: visually attractive materials and/or manipulatives for the right and text for the left. Allowing an assortment of ways to demonstrate mastery of the skills will also ensure the activation of the different brain structures housing vital information.

No discussion of this nature is complete without the mention of the role of emotion in learning. The frontal lobes which play a key role in learning are connected to the limbic system which is the brain's emotional center. A resourceful teacher will not only attempt to connect positive emotions to the

learning experience but will also employ "[t]echniques such as dramatizations, humor, movement, or arts integration" (Hardiman, 2003, p. 53) to make the most of neural connections between these brain structures. Armed with the latest in brain science, educators are ready to put the brain's natural functions to work as they provide learning opportunities to a new group of students.

#### Works Cited:

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