STUDENT LEARNING: NATURE OR NURTURE?

by:
Mayeth Ignacio Molina
Bataan High School for the Arts

For years, there has been an ongoing debate regarding the very nature of learning. Since the adoption of formal education worldwide, scholars have been puzzled about how students learn. There have been various theories that explain the nature of learning such as behaviorism, essentialism, and the like. Among the more contemporary principle, the brain-based learning approach has ignited an educational revolution by infusing neuroscience into understanding learning.

Brain-based learning has been defined as calibrating teaching in accordance with the way the human brain naturally learns (Caine & Caine, 1994). This new approach to learning has paved the way for a better understanding of how students think by examining brain functions. Essentially, the considerable body of knowledge from the previous studies on brain-based learning has initiated important milestones in the field of education (Gülpinar, 2005). There are several parts of the brain that play roles in learning such as the prefrontal cortex and cerebellum, the amygdala, and the hippocampus.

Initially, studies found that sequence learning has been attributed to the prefrontal cortex and the cerebellum. For instance, through the findings from patients with cerebellar damage in the laboratory, Middleton, and Strick (2001) suggested that both the prefrontal cortex and the cerebellum can be attributed to certain functions in learning as well as the execution of sequential behavior and performance.

Another part of the brain that influences learning is the hippocampus. The hippocampus is included in a larger structure, the hippocampal formation. This part of

the brain is attributed to memory, learning, navigation, as well as the perception of space. Moreover, it receives information from the cerebral cortex and may play a role in the development of Alzheimer's disease. Furthermore, the hippocampus is also found to be responsible for the normal recognition of memory as well as the projection of information to cortical regions that give memories meaning and connect them with other connected memories.

The third part of the brain is the amygdala. The amygdala and orbitofrontal are the two main parts of the limbic system. Studies revealed that the amygdala is responsible for the regulation of emotions and consolidation of memory. Furthermore, it was also found that the amygdala facilitates the encoding of memories at a deeper level when the event is emotionally arousing.

While these findings from the different parts of the brain suggested that indeed, "nature" plays a huge part in student learning, there are other neurological findings that contend this principle. One of these findings in the field of neuroscience is the concept of neuroplasticity. Neuroplasticity is defined as the ability of the nervous system to modify and change the activities in the human brain as a response to intrinsic or extrinsic stimuli. This modification in the neural network involves reorganizing structure, functions, or connections within the human brain (Mateos-Aparicio, & Rodríguez-Moreno, 2019). This process revealed that student learning can also be "nurtured". By utilizing appropriate stimuli for learning, the reorganizing of neurons within the neural network will be more effective, thus, a more improved student performance. With these findings, it can be said that both nature and nurture play their part in students learning. What really matters now is how these facilities for student learning improvement will be utilized by the primary source of student knowledge, the educators.

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