How the Brain Learns Lesson 4: Factors that Affect Learning

Objective: Upon completing this lesson, you will be able to identify the affects that sleep, nutrition, exercise and stress have on learning.

We discussed the physiological aspects to learning in Lesson 1 and we will go back to that in this final lesson regarding how your brain learns. Your brain is affected by various chemicals some of which are sent out by a part of your brain called the *amygdala*. The amygdala can be controlled by emotion and as a result it controls the type of neurotransmitters and chemicals in your brain. Some of these help the learning process and some inhibit the process. You can help avoid what's sometimes referred to as an 'amygdala hijacking' by taking care of yourself. Here are a few things that you can control.

SLEEP – Because sleep is the time when the brain is least distracted by the sensory input bombarding it all day, it can devote a greater portion of its energy (metabolism) to organizing and filing the memories formed during the day. It is believed that memories that remain after one day are in the process of being successfully consolidated into neuronal pathways with new dendrites and synaptic connections. It is during sleep that the brain reaccumulates the greatest amount of the neurochemicals needed to stimulate dendritic growth. Studies suggest that if students review their notes thoroughly and stop and go to sleep when they begin to feel drowsy, the quality and quantity of retained memory is superior to extending the review time any number of hours once drowsiness has set in. This recognition of the need for sleep has led researchers to test and confirm their predictions that increasing sleep time from six or less to eight hours can increase memory and alertness up to 25 percent. (Willis, 2006)

NUTRITION – Your brain must manufacture the right proteins and fats to do things such as grow new connections or add myelin, the fatty sheath around axons. You do this by digesting proteins and fats in food and using the pieces, that is, the amino acids and fatty acids, to make the new brain proteins and fats. (Chudler) We won't get into the details of certain foods in this short lesson, but remember it is important to incorporate a healthy diet. Don't skip meals, have healthy snacks throughout the day and drink plenty of water to maintain your energy.

EXERCISE – Regular physical activity can improve the cognitive function (process related to knowledge) and brain plasticity (ability to change). How much exercise? Many agree that half an hour of moderate exercise at least 5 days a week is a good place to start.

STRESS – It's not easy to control stress and there are so many factors that can cause stress. But stress sets the amygdala off on a path that can hinder the learning experience. What you can do is try to recognize what may be causing stress and then finding a resource or person to help you deal with it. MSUM has resources available to help whether it be health related, personal or family issues or other factors. For example: maybe organizing your schedule could help if you feel overwhelmed by everything you need to get done. Utilize the resources that available to help you.

Works Cited

Chudler. (n.d.). *Nutrition and the Brain.* Retrieved June 22, 2015, from https://faculty.washington.edu/chudler/nutr.html

Willis, J. (2006). *Research-Based Strategies to Ignite Student Learning: Insights from a Neurologis and Classroom Teacher.* Alexandria: Association for Supervision and Cirriculum Development (ASCD).

Name _____

1. Explain why sleep is important to the learning cycle and what physically take place in the brain during sleep.

2. What part do good nutrition and exercise play in the learning cycle?

3. This is the final lesson on how the brain learns and this is the last item.

Please comment on any parts of these lessons that you found useful in understanding how you can help yourself learn, including any changes you have made, or will make, to improve learning.