

The Pull Approach to Learning: Reinforcing Neural Pathways in the Brain

Art Lightstone, May 18, 2010, updated February 4, 2011

Reinforcing the neural pathways within the brain is a key strategy that students can employ in their efforts to improve academic achievement. In order to do this, students must take a very deliberate and controlled approach to their use of class time as well as their study and review methods. Essentially, every time one learns something new, a new neural pathway is formed in one's brain. Fair enough. So then, what are the implications of this? Well, believe it or not, students must ensure that they actually limit the number of times they 'learn' a new concept. Each time a student *learns* and then *relearns* the same concept, the student will produce a new, albeit weak, neural pathway in his brain. How is it that we "learn" and "relearn" material? The ways are many. If a student pays moderate attention to a concept taught in class, then the student will learn the concept. If the student then forgets about the concept and reads about it in his textbook, he will relearn it. If the student then studies the same concept before a test and highlights the concept in his textbook, he will relearn it yet again. If the concept seemed somewhat new to the student each time he learned it, then he successfully created three weak neural pathways containing vague, perhaps even contradictory notions of the same piece of information.

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The key to effective learning is to learn a concept once! Learn it once, learn it well, and then reinforce the same concept while studying. How can students do that? Simple: students must pay full attention in class while material is being presented, discuss the concept with the teacher while it is being taught, and clarify any points of confusion during the same class. Then, when a student wishes to study the concept later, the student must 'pull' the knowledge she already has about the concept 'out' of her brain. (We must avoid 'pushing' the *same* information back 'in' our brains in the hope that it will magically flow down the same neural pathway that was generated the first time we learned the concept.) Brain research¹ shows that in *pulling* the information out from the brain, we reinforce existing neural pathways, thus making those pathways stronger and easier to access in the future. In other words, we actually learn the concept better.

How do we "pull" information from our brains? Basically, we force ourselves to independently recall the information. We can do this by writing out study notes (*not copying* existing notes), by having someone ask us about a concept (*not tell* us about the concept), or by just thinking about the concept as we examine a review sheet for a test or exam (ensuring we truly 'know' every item on the review sheet).

As strange as it sounds, pulling information out of our brains – as opposed to pushing information into our brains – is one of the most effective things we can do to improve our learning.

¹ Ralph Miller, PhD. Binghamton University- SUNY. "Functional Analysis of Learning and Its Failures: The Benefits of Imperfect Retrieval." Presented August 14, 2010 APA Annual Convention, San Diego, CA