



శ్రీ వేపచేదు విద్యా పీఠము

VEPACHEDU EDUCATIONAL FOUNDATION

మన సంస్కృతి

Mana Sanskriti (Our Culture)

Chief Editor: Dr. Sreenivasarao Vepachedu, Esq.

MEMORIZATION, THE SECRET OF THE SMART

Neurons that fire together, wire togetherⁱ. To set a new habit in place, repetition is required. When you practice something deeply, intentionally, and with some element of struggle a neural pathway is formed. Neurons are now firing together in a new sequence, and thus are wiring together as a collective. Repeated firing signals that this neural pathway is important. Repeated firing with deep practice alerts oligodendrocytes and astrocytes that this pathway needs to be upgraded, or insulated, and the process of myelination begins. Heavily myelinated neural pathwaysⁱⁱ are up to 300 times faster—they've been optimized for speed and efficiency. This is how we form new automatic behaviors, also known as habits or habitual behavior choices. Key to success in memorization leading to be smart is repetition, which requires perseverance through the uncomfortable part of learning. Perseverance in turn depends on your will power and disciplineⁱⁱⁱ.

The above practice is called “Rote Learning,” by some Western educators, who firmly believe that it is an outdated technique which has no valid place for its use in the classroom today. Increasingly, rote learning is being abandoned for so-called newer techniques such as associative learning, meta cognition, and critical thinking instead of being used as a functional foundation to higher levels of learning. The mental ability to memorize is often used as an indicator of intelligence. No doubt, the two are strongly linked, but memory is not always a reliable indicator of intelligence. Working memory does not directly affect the level of intelligence of a student. As an alternative approach to subject areas that require memorization with disdain and conflict, teachers can build higher-level critical thinking skills with rote learning as the foundation. When the role of rote memorization is an end in itself, instead of a means to an end, rote memorization fails as a building block to critical thinking. Of course in the early stages, the stage of actually memorizing the material, it is an end in itself. The end being that the students gets the information memorized so that they can move into concepts and application. The longer view is that the information acquired by rote, is the house of higher-level learning. Once students have these down and memorized, they can more easily combine them and use them in their thinking. Otherwise, they just have to pause and use a calculator or

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computer, which will really slows things down—not to mention disengages and distracts the student^{iv}, and that frustrates professors at universities, who are fed up with the from “new math” and “inquiry-based” teaching approaches that emphasize such things as estimating and multiple “strategies” in basic calculations with complicated methods of solving math problems in a bid to develop students’ deeper understanding of how those calculations work. .^v

It is a well-known fact that memorizing the basics in any field, such as basic addition or the multiplication tables in math. It marks a key shift in a child’s cognitive development, because it helps bridge the gap from counting on fingers to complex calculation, has been rediscovered according to the modern Western new brain scanning research. The progression from counting on fingers to simply remembering that, for example, six plus three equals nine, parallels physical changes in a child’s brain, in which the hippocampus, a key brain structure for memory, gradually takes over from the pre-frontal parietal cortex, an area of higher order reasoning^{vi}.

While Bob Compton's film, Two Million Minutes, discusses rote learning and that many students in India and China spend more time acquiring academic knowledge, and states what works in the Indian culture is going to be different from what works in our American culture^{vii}. American culture is the result of American over-reliance on multiple-choice tests^{viii} than anything inherently evil about repetition or memorization^{ix}. India adopted the “American multiple-choice tests,” as an advanced technique from the West.

Of course, there are several advantages to multiple choice tests, and if quality assured, it can be a very effective assessment technique^x, which after all is an American invention that, some critics say, has robbed schools of the creative clash of intellects that make Plato's dialogues still absorbing^{xi}, by making rote memorization inescapable. Coming full circle, rote memorization is not bad for brain, as the new research tells the old story “practice makes perfect” through the lens of modern gadgets, techniques and imagery.

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"Earth provides enough to satisfy every man's needs, but not every man's greed." - Mahatma Gandhi
Hinduism is a way of life, with diversity of religion, and Indian teachings share the importance
of seva (service).

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Om! Asatoma Sadgamaya, Tamasoma Jyotirgamaya, Mrityorma Amritamgamaya, Om Shantih, Shantih,
Shantih!

(Aum! Lead the world from wrong path to the right path, from ignorance to knowledge, from mortality to
immortality, and peace!)

ⁱThis axiom is attributed to Donald Hebb, a Canadian neuropsychologist. It describes a basic mechanism for synaptic plasticity, where an increase in synaptic efficacy arises from the presynaptic cell's repeated and persistent stimulation of the postsynaptic cell. Introduced by Donald Hebb in his 1949 book The Organization of Behavior, the theory is also called Hebb's rule, Hebb's postulate, and cell assembly theory. The Hebb Rule maintains that when neurons are repeatedly activated at the same time, they become associated, and this facilitates synaptic strength.

<http://www.psych.ualberta.ca/GCPWS/Hebb/Replication.html>;

ⁱⁱ http://www.dartmouth.edu/~rswenson/NeuroSci/chapter_3.html

ⁱⁱⁱ <http://www.forbes.com/sites/christinecomaford/2014/11/07/the-truth-about-how-your-brain-gets-smarter/>

^{iv} <http://education.cu-portland.edu/blog/curriculum-instruction/what-is-rota-learning/>

^v <http://news.nationalpost.com/2013/09/13/frustrated-professors-convince-schools-to-step-back-from-new-math-and-go-back-to-basics/>

^{vi} <http://news.nationalpost.com/2014/08/21/math-wars-rota-memorization-plays-crucial-role-in-teaching-students-how-to-solve-complex-calculations-study-says/>

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vii http://www.huffingtonpost.com/c-m-rubin/the-global-search-for-edu_2_b_880028.html

viii http://www.flaguide.org/cat/multiplechoicetest/multiple_choice_test1.php

ix http://www.huffingtonpost.com/justin-snider/rote-memorization-testing_b_817170.html

x http://lsc.cornell.edu/Sidebars/Study_Skills_Resources/multiplechoicetests.pdf

xi <http://www.washingtonpost.com/wp-dyn/content/article/2006/11/13/AR2006111301007.html>

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