Make it Stick: The Science of Successful Learning

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This book draws upon a multitude of principles regarding cognitive psychology as they relate to learning. The book first refers the importance of spaced repitition when it comes to the effective remembrance of information this is due to the fact that the act of forgetting follows a logarithmic curve. Upon the utilization of spaced repitation you are utilizing not only this logarithmic forgetfulness curve, but also leveraging the power of REM sleep in regards to learning, although these two may not be mutually exclusive.

Another point in which the authors of this book touches upon is that of the massive positive effect of testing. This testing allows for the effortful retrieval of information. This allows for a higher understanding of the information and slower rates of forgetting material. Many students currently have massively misguided ethos pertaining to studying. A lot of students follow the path of least resistance when it comes to studying, in that they just read and re read the content in which they are trying to learn, rather they should be utilizing strategies such as active recall to more efficiently learn the material. This more effortful style of learning has a plethora of empirical peer reviewed research studies to back the efficacy of such deployment of such strategies.

Another aspects of good learning is the ability to make contextual connections

between the subjects that you learn. Similar to a graph in Computer Science these connections allow you to further strengthen the ~~co~~ your understanding of the given concepts as they relate to other things in the world.

The authors go over many cases of teachers adapting from one midterm, one final to regular quizzes; and you can see there is a statistically significant delta between the mean grades of the students in a positive way. This can be seen across a multitude of fields; attributed to the fundamental actions with this book spaced repition and active recall. Now to develop practical protocols to effectively leverage the dixions of active recall, spaced repition, and building mental models. To maximise the effect of active recall and spaced repitition I believe it is best to break up studying based upon days due to the strong effect sleep has upon learning in both the deep sleep and rem sleep portions. Within this unit you want to find the number of days in which you have almost forgetting forgot the information, but not quite. Essentially you are trying to do a multivariate optima problem where you are trying to find the maximum "forgetfulness" while also minimizing complete forgetfulness which will also lead to maximizing the amount of information to retrieve the information, could probably summed using negative log likelihood. following is a rough eqn. f = forgetfulness e = effort i = errors

$$\max_{f,e,i} \left[-\log(i) + f + e \right]$$

following is a rough sketch using negative log-likelihood