

Notes on Effective Learning

Based on
make it stick

The Science of Successful Learning
Brown, Roediger & McDaniel, 2014

January 5, 2015

Learning: you're doing it wrong

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- Learning is best when it's *effortful*.
- We are *poor judges* of when we are learning well.
- *Rereading text* and *massed practice* are the most practiced methods, but are the *least productive*.
- These methods give rise to feelings of fluency that are mistaken for true mastery.

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- Trying to solve a problem *before being taught the solution* leads to better learning, even if errors are made.

Learning styles: NOT

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- People do have multiple learning strategies, and all people learn best when they “go wide.”
- Limiting instruction to your preferred style reduces learning.

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- When you learn underlying principles or **rules** you are more adept at picking the right solutions in unfamiliar situations.
- This skill is better acquired through **interleaved and varied practice** than massed practice.

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- Testing helps calibrate our judgements.
- “Shooting an azimuth.”

Learning requires a **foundation of prior knowledge**



"Mr. Osborne, may I be excused? My brain is full."

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- All of these memory masters use mnemonic tricks that involve relating the new knowledge to something they already know, such as the “memory palace.”

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- When learning is hard, you're doing important work.

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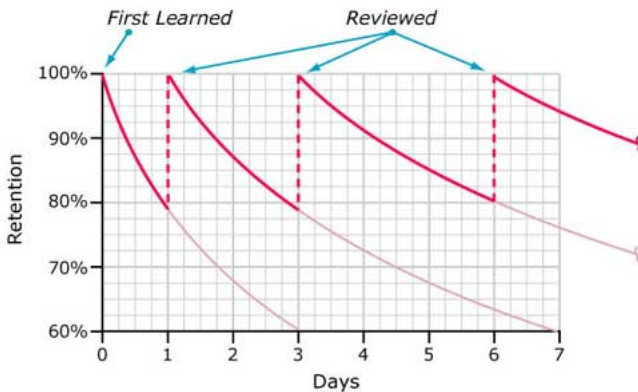
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QUIZZING IS A LEARNING TOOL!

Spaced repetition

Typical Forgetting Curve for Newly Learned Information



Learning tips

- Practice retrieving from memory
 - Use flash cards: www.ankisrs.net
 - Use Cornell note taking system
`http://lsc.cornell.edu/LSC_Resources/cornellsystem.pdf`
 - Look up from the book and summarize
 - Invent quiz questions as you read
 - Don't listen to your intuition!

Learning tips

- Space out retrieval practice
 - No cramming
 - Use flash cards: www.ankisrs.net
 - Avoid massed practice

Learning tips

- Interleave different study problems
 - Move back and forth in the text
 - Move between subjects
 - Move between study strategies

Learning tips

- Elaboration
 - explain it in your own words and relate it to your own experience

Learning tips

- Generation
 - Try to answer a problem before being shown the solution

Learning tips

- Reflection
 - Write out essays on your learning

Learning tips

- Calibration
 - Use an objective instrument to assess yourself

Learning tips

- Mnemonic devices
 - Mind maps
 - Memory palace
 - Think in vivid, crazy images
 - Major memory system for numbers

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