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EDUCATION

Highlighting Is a Waste of Time: The Best and Worst Learning Techniques

Some of the most common strategies for retaining knowledge are the least effective, according to a new report

By Annie Murphy Paul [@anniemurphypaul](#) | Jan. 09, 2013 | 130 Comments

Why Highlighting Is a Waste of Time: The Best and Worst Learning Techniques



In a world as fast-changing and full of information as our own, every one of us — from schoolchildren to college students to working adults — needs to know how to learn well. Yet evidence suggests that most of us don't use the learning techniques that science has proved most effective. Worse, research finds that learning strategies we do commonly employ, like rereading and highlighting, are among the least effective.

The scientific literature evaluating these techniques stretches back decades and across thousands of articles. It's far too extensive and complex for the average parent, teacher or employer to sift through. Fortunately, a team of five leading psychologists have now done the job for us. In a [comprehensive report](#) released on Jan. 9 by the Association for Psychological Science, the authors, led by Kent State University professor John Dunlosky, closely examine 10 learning tactics and rate each from high to low utility on the basis of the evidence they've amassed. Here is a quick guide to the [report's](#) conclusions:

The Worst

Highlighting and underlining led the authors' list of ineffective learning strategies. Although they are common practices, studies show they offer no benefit beyond simply reading the text. Some research even indicates that highlighting can get in the way of learning; because it draws attention to individual facts, it may hamper the process of making connections and drawing inferences. Nearly as bad is the practice of rereading, a common exercise that is much less effective than some of the better techniques you can use. Lastly, summarizing, or writing down the main points contained in a text, can be helpful for those who are skilled at it, but again, there are far better ways to spend your study time. Highlighting, underlining, rereading and summarizing were all rated by the authors as being of "low utility."

The Best

In contrast to familiar practices like highlighting and rereading, the learning strategies with the most

evidence to support them aren't well known outside the psych lab. Take distributed practice, for example. This tactic involves spreading out your study sessions, rather than engaging in one marathon. Cramming information at the last minute may allow you to get through that test or meeting, but the material will quickly disappear from memory. It's much more effective to dip into the material at intervals over time. And the longer you want to remember the information, whether it's two weeks or two years, the longer the intervals should be.

The second learning strategy that is highly recommended by the report's authors is practice testing. Yes, more tests — but these are not for a grade. Research shows that the mere act of calling information to mind strengthens that knowledge and aids in future retrieval. While practice testing is not a common strategy — despite the robust evidence supporting it — there is one familiar approach that captures its benefits: using flash cards. And now flash cards can be presented in digital form, via apps like [Quizlet](#), [StudyBlue](#) and [FlashCardMachine](#). Both spaced-out learning, or distributed practice, and practice tests were rated as having “high utility” by the authors.

The Rest

The remainder of the techniques evaluated by Dunlosky and his colleagues fell into the middle ground — not useless, but not especially effective either. These include mental imagery, or coming up with pictures that help you remember text (which is time-consuming and only works with text that lends itself to images); elaborative interrogation, or asking yourself “why” as you read (which is kind of annoying, like having a 4-year-old tugging at your sleeve); self-explanation, or forcing yourself to explain the text in detail instead of passively reading it over (its effectiveness depends on how complete and accurate your explanations are); interleaved practice, or mixing up different types of problems (there is not much evidence to show that this is helpful, outside of learning motor tasks); and lastly the keyword mnemonic, or associating new vocabulary words, usually in a foreign language, with an English word that sounds similar — so, for example, learning the French word for key, *la clef*, by imagining a key on top of a cliff (which is a lot of work to remember a single word).

All these techniques were rated of “moderate” to “low” utility by Dunlosky et al because either there isn't enough evidence yet to be able to recommend them or they're just not a very good use of your time. Much better, say the authors, to spread out your learning, ditch your highlighter and get busy with your flash cards.

