

Retrieval Practice: A Memory Exercise with Surprising Benefits

by Louise Rasmussen - August 30, 2013

<https://www.globalcognition.org/retrieval-practice/>

Memory exercises promise to help you get smarter by strengthening your memory. Students, teachers, and scientists are always on the lookout for memory exercises that really work.

Many memory exercises focus on building up short-term memory, or working memory. These [short-term memory exercises](#) don't appear to help you learn better.

Other memory exercises focus on long-term memory. Two of these are called retrieval practice and elaboration. The research shows both of them to have benefits for learning. They are both [excellent study skills](#) to have on hand. And ones you can learn and practice in our [study skills course](#).

A study published in Science magazine suggests that one of these two memory exercises, retrieval practice, doesn't just work. It works surprisingly well.

This study made two unexpected discoveries about the value of retrieval practice as compared with elaborative study:

1. Retrieval practice helps you remember more information than elaboration.
2. Retrieval practice helps you understand the information better than elaboration.

Elaboration and Retrieval Practice

Elaborative study, or elaboration, is a powerful memory exercise. Education research is ripe with demonstrations that elaboration is an effective way to not only remember, but also increase your understanding of a subject you're studying.

One way to elaborate is to generate an explanation for why a fact or concept is true (or false). Another way is to self-explain. Simply explain to yourself how the new ideas you're learning relate to each other, or explain how the new ideas relate to information you already know. Still another is to [make a concept map](#), drawing out how ideas relate to one another.

Elaborative study increases your understanding of a subject because it makes the ideas in your memory better linked with each other. The more links you have the more 'trails' you have leading to the information, increasing your chances of finding it again later.

Retrieval practice is the activity of recalling information you have already committed to memory.

You can practice retrieving information by simply trying to recall everything you've read or learned about a subject. Or, you can use the [self-test approach](#). Self-testing means that you [create questions](#) about the subject and answer them yourself.

Retrieval practice may seem a bit unappealing. It just doesn't seem as cool as making a concept map. Plus, the long-term value of memory exercises that only involve retrieval just seems counterintuitive. Surely the mere activity of recalling can't produce meaningful learning?

Putting Memory Exercises to the Test

Cognitive scientists Jeffrey Karpicke and Janell Blunt from Purdue University put these memory exercises to the test. They [published](#) their surprising finding that, "Retrieval Practice Produces More Learning than Elaborative Studying with Concept Mapping," in *Science* magazine.

Karpicke and Blunt conducted a study in which participants studied two different science texts. They studied one text using elaboration and the other using retrieval practice.

When the students used the elaboration technique they read the text and drew concept maps of the concepts in the text. [Concept maps](#) are diagrams that use nodes to represent concepts and links between the nodes to represent relationships between them.

When the students used the retrieval practice technique they read the text, put it away, then wrote down everything they remembered, then they looked at the text one more time, and then recalled one last time.

The students were asked which technique they thought would be more effective. They predicted remembering more of the information they had studied using elaboration.

A week later Karpicke and Blunt assessed the effectiveness of the two memory exercises. They gave the students two kinds of tests: a short answer test and a test that involved creating concept maps. The short answer test included both verbatim questions and inference questions that required deeper understanding.

They found that the students did better on all elements of both types of tests when they had used retrieval practice during original learning than when they had used elaboration.

Give Retrieval Practice a Go

Why would retrieval practice help you do better on a test that asks you to draw a concept map than studying by drawing concept maps?

Karpicke and Blunt think that retrieval practice helps you learn by allowing you to hone the cues you use to find information once it's been stored in memory. Recall that elaboration is an effective memory exercise because it gives you more pathways to find information. Retrieval practice works by making sure you have pathways that can lead you straight to the information you're looking for.

This research shows that our assumptions about best ways to learn aren't always true.

Yet, retrieval practice is fairly easy to incorporate into other study activities. For example, maybe you like to have your students draw concept maps. You can have them put their materials away and create concept maps from memory. Or, have them draw the concept maps with support first. Then, ask them to do it

again from memory only.

This way you're engaging both elaboration and retrieval practice.

Image Credit: [philip.bitnar](#)

Jeffrey D. Karpicke, & Janell R. Blunt (2011). Retrieval Practice Produces More Learning than Elaborative Studying with Concept Mapping *Science*, 331, 772-775 DOI: [10.1126/science.1199327](https://doi.org/10.1126/science.1199327)

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