

Writing to Learn, Reciting to Remember:

Applying Learning and Memory Principles to Flashcards

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Many students do not study effectively. Some do not correctly learn the concepts they are studying, some do not remember what they have learned, and some have both comprehension and retention problems. It is easy to give good advice to students who are failing to remember what they have learned. In fact, you could probably just reiterate the study tips discussed in their introductory psychology book’s memory chapter (e.g., use elaborative rehearsal, retrieval practice, and distributed practice). It is harder to give good advice to students who are failing to fully understand the concepts they are studying. You probably could not refer students to their introductory psychology book-- such texts rarely discuss how prototypes, exemplars, overextension errors, and negative instances relate to studying. Even if you did find or create such advice, students might not listen to (because they tend to overestimate how well they understand the material) or benefit from (because they would listen but not practice) your advice. To help students understand, retain, and apply both effective concept learning strategies and effective memory strategies, we developed a tutorial.

Our tutorial focuses on using flashcards effectively because students often use flashcards. For example, Wissman, Rawson, and Pyc (2012) found that almost 70% of the students in an introductory psychology course used flashcards. However, most of the students in that study had little idea that flashcards could be an effective way to learn key concepts, and many of the students had mistaken ideas about effective ways to use flashcards to remember concepts. We developed a PowerPoint® tutorial that helps students use flashcards effectively. Specifically,

1. The tutorial helps students understand that memorizing a definition is different from learning a concept by showing them that
   1. One problem in learning concepts is the tendency to make overextension errors.
   2. A concept is made up of several subconcepts, each of which is vulnerable to overextension errors. Consequently, students need to check that their flashcards and the responses they give to their flashcards are correct—something that nearly half the flashcard users in Wissman et al.’s study (2012) did not do.
   3. Recognizing that a term sounds familiar is different from understanding a term, which is, in turn, different from being able to use a term.
   4. Knowing a prototype, knowing more than one exemplar of a concept, and recognizing negative instances of a concept will help students learn concepts.
2. The tutorial helps students remember the concepts they learned by telling students to
   1. Engage in active rehearsal rather than passive rereading of cards (to take advantage of the testing effect and to fight the illusion of knowing; Brown, Roediger, & McDaniel, 2014; Karpicke & Blunt, 2011; Oakley, 2014).
   2. Generate examples that relate to their lives (to take advantage of the self-reference effect) and to draw on their cards (to take advantage of imagery).
   3. Mix up the order in which they test themselves over the terms (to take advantage of interleaving; Brown et al., 2014; Oakley, 2014).
   4. Study the terms they miss more than ones they get right.
   5. Use a large stack of cards. (Wissman et al.’s research suggests that most students believe, contrary to the evidence, that using a smaller stack of cards is better than using a larger deck.)
   6. Say the answers to their flashcards aloud.
   7. Sort their cards into categories, thus promoting organization and deeper processing.

To use the tutorial, give students the tutorial’s web address. At the end of the tutorial, students can take a quiz and print out their results. Have students turn in the printout of their results along with the models of flashcards that the tutorial asks them to make.

References

Brown, P. C., Roediger, H. L., III, & McDaniel, M. A. (2014).  *Make it stick: The science of successful learning*. Cambridge, MA: Belknap.

Karpicke, J. D., & Blunt, J. R. (2011). Retrieval practice produces more learning that elaborative studying with concept mapping. *Science*, *331*, 772-775.

Oakley, B. (2014). *A mind for numbers*. New York, NY: Tarcher-Penguin.

Wissman, K. T, Rawson, K. A., & Pyc, M. A. (2012). How and when do students use flashcards? *Memory,* *20*, 568-579.