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Remembering to Learn: Five Factors for Improving Recall

AS A PROFESSOR of cognitive psychology, I teach about memory, especially about when and why our memories often fail us. Students are excited to apply this material to their everyday lives.

During a recent class, a student asked whether other faculty were familiar with this research and remarked that it would be helpful if everyone structured their lessons with this knowledge in mind.

I offer the following tips taken from basic memory research. All of these findings can be easily applied to how you teach your classes and advise students.

1. **Attend to information.** How often are your students checking text messages while listening to your lecture, arguing that they are really good at multitasking? Remind your students that most failures of memory are not problems with retrieval but with encoding. Most of the time we do not have difficulty pulling information out; the problem is that we never got it in to begin with. To make this point, I use the classic Nickerson and Adams (1979) penny task and ask students to draw the head of a penny from memory. They quickly realize that they have "forgotten" which direction Lincoln is facing or are unsure which phrases are on the heads or tails side. Explain to your students that they didn't forget what a penny looks like. The truth is that they never bothered to encode the information. To remember something, they need to engage in controlled processing. They have to block out other distractions and focus on the task at hand.

2. **Engage in deep processing** and self-reference. Deep processing involves thinking about the meaning of the information and connecting it to personal experiences. To make this point, I use a modified version of Craik and Tulving's (1975) study and present students with a list of adjectives, such as "creative," "methodical," or "serious." For some of the words they are asked a question about how it is spelled; for example, "Does the word contain the letter T?" For other words, they are asked, "Does the word describe you?" Later, students are asked to recall as many of the words as possible. Students are significantly more likely to recall words from the "describe list" because they had to think about the meanings and apply the words to themselves. Simply reading over a paragraph of text or listening to a lecture does not guarantee encoding it into memory. What one thinks about while listening or reading is what matters.

3. **Generate cues.** Students often request that I provide more examples of the concepts we are discussing. Although instructor-provided examples and explanations are important, I teach my students that it is more important that they come up with their own examples and cues. Research by Mäntylä (1986) reveals that participants recalled 36 percent more concepts when using self-generated cues than when using cues developed by someone else.

4. **Create context**. Instructors know that students often come to class unprepared. Students argue that they prefer to hear the lecture before reading the chapter. To explain why skimming the chapter before class is important, I read my students an oddly worded passage from a study by Bransford and Johnson (1972). First, I show half of the class a picture that creates context for what they are about to hear. For this half of the group, the strangely worded passage is clear, and they find they are able to recall large portions of it after hearing it just once. The group not shown the picture fails to make sense of what they have heard and have difficulty recalling details. Without looking at material before class to create context, it is difficult for new material to make much sense.

5. **Test frequently**. This is the easiest strategy and can have the most impact on students. Contrary to expectation, Roediger and Karpicke (2006) found that seeing a passage only once and then forcing yourself to recall it from memory leads to better retention than repeatedly reading the passage. Incorporate brief tests or quizzes into your course, and encourage your students to self-test as they study. Reading a passage and then stopping to ask yourself what you just read is going to be more effective than reading it twice.

Students may have heard much of this advice before. However, taking the time to put students through these demonstrations

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Three Active Learning Strategies That Push Students Beyond Memorization

THOSE WHO TEACH in the health disciplines expect their students to retain and apply every iota of learned material. However, many students come to us having achieved academic success by memorizing the content, regurgitating that information onto an exam, and promptly forgetting a good portion of it. In health, as well as other disciplines where new material builds upon the material from the previous semesters, it is critical for students to retain what they learn throughout their coursework and as they begin their careers as a nurse, engineer, elementary teacher, etc.

So, how do we get students to retain this knowledge? Here are three active learning strategies for pushing students beyond simple memorization.

1. **Case Studies and Simulations** – Forsgren, Christensen, and Hedemalm (2014) found that case studies stimulate the student's own thinking and reflection, both individually and in groups. Through reflection, the student gains a broader view, increased understanding, knowledge, and deeper learning. Case studies are a form of problem-based learning that encourage the student to think critically and apply "book knowledge" to everyday practice and problems that will occur in the workplace. A literature review reveals very little research on using case studies in fields other than health, law, and business. However, case studies could certainly be written for any field of study. Many other methods of assisting with knowledge retention come from healthcare fields but can easily be adapted to other majors. Simulation—whether high-tech as in mannequins or low-tech as in role play—is a good method to help the student apply knowledge to real world scenarios.

2. **Concept Maps** – Concept maps are graphical tools for organizing and representing knowledge and can be used to help students visualize connections between words and concepts. The first step is defining a focus question or problem which the student then internalizes a strategy for defining and clarifying (Eberly Center for Teaching Excellence, 2014). Concept maps using real world situations can help reinforce key ideas by encouraging students to think both creatively and analytically about previously learned information and apply it to new scenarios.

3. **One-Minute Papers** – A classic among active learning techniques, the one-minute paper remains a simple yet effective way to gauge student learning. I use these papers as an assessment of my own teaching efficacy but more importantly to get students to reflect on what went on in the classroom that day. My questions are all open-ended so as to encourage reflection and feedback on the subject matter. Possible prompts for a one-minute paper, include:
   - The clearest point of today's class was:
   - The muddiest point of today's class (or something that confused me or I want clarified) was:
   - How I prepared for class today:
   - What I liked best that helped me learn:
   - What I wish had been discussed during today's class:

In summary, we all know that lecturing is not the most effective manner of teaching, any more than cramming is an effective form of learning. Active learning strategies such as these move students from passive to active participation in their learning; boosting retention in the process. As an added bonus, these methods fit well in the flipped learning environment that many instructors are using today.

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Sydney Fulbright, PhD;Three Active Learning Strategies That Push Students Beyond Memorization; Faculty Focus; September 27, 2018; [https://www.facultyfocus.com/articles/effective-teaching-strategies/three-active-learning-strategies-push-students-beyond-memorization/] November 8, 2018.

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will allow them to experience how these small adjustments can influence their recall. They will then see the value of changing the way they study.

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Debrora S. Herold, PhD; *Remembering to Learn: Five Factors for Improving Recall*; Faculty Focus; October 11, 2018 [https://www.facultyfocus.com/articles/teaching-and-learning/remembering-learn-five-factors-improving-recall/] November 8, 2018.