*The article below gives some great tips on memorizing words. It is by Michelle Miller, Ph.D., and is from the November 2014 issues of The Teaching Professor. Published by Magna Publications [http://www.magnapubs.com] 2718 Dryden Drive, Madison, WI 53704, 1-800-433-0499. Copyright ? 1972-2016 Magna Publications. All Rights Reserved.*

I was wrapping up a presentation on memory and learning when a colleague asked, ‘How do we help students learn in courses where there’s a lot of memorization?’ He explained that he taught introductory-level human anatomy, and although the course wasn’t all memorization, it did challenge students’ capacity to retain dozens of new terms and concepts.

The question itself is tricky because most teaching professionals are heavily invested in the idea that learning isn’t about being able to regurgitate facts on an exam. We also worry, and with good reason, that emphasizing rote learning steals time and effort away from the deeper thinking that we want students to do. But in my work I’ve come to realize that memorization deserves some airtime because it is one important route to building content knowledge and expertise. Furthermore, acquiring content knowledge doesn’t have to detract from critical thinking, reasoning, or innovation - rather, it can complement all these. Cognitive scientists are making new discoveries all the time about the connections between memory and processes such as drawing inferences, making predictions, and other skills that make up the ability to think like an expert in a discipline.

So what techniques target this specific teaching and learning challenge? We’re all familiar with mnemonics such as the first-letter technique - using a word such as RICE (rest, ice, compression, elevation) or a catchy phrase (Every Good Boy Does Fine) to remember a sequence of information. Mnemonics are one good tool, but what else can we offer?

For starters, we should convey to students (and keep in mind ourselves) that memorization challenges nearly everyone because the mind simply isn’t set up to take in reams of disjointed facts. Our memory systems evolved to be picky about what we remember, selecting the information that is most relevant to our goals and discarding the rest. Understanding this helps us and our students have realistic expectations about the level of effort needed to succeed.

It also helps to understand how we create memories for words, because many memorization tasks involve scientific terms, foreign language vocabulary, and the like. How we do this has been hotly debated among researchers, but one view is that we rely on a special piece of mental machinery called the phonological loop that holds speech sounds.

If you’ve ever muttered a phone number to yourself while you ran around looking for a pencil to write it down with, you’ve experienced the phonological loop in action. But recycling phone numbers isn’t the phonological loop’s main reason for existing. Rather, its real job kicks in when we run into a word we haven’t heard before. When this happens, the phonological loop grabs onto the sequence of sounds and keeps it fresh while other memory systems set up representations of what the new word means. The catch is that phonological loop capacity varies fairly substantially from individual to individual. This means that words of three, four, or more syllables overwhelm some people’s ability to learn new words on the fly.

With these two points in mind - that memory doesn’t handle disjointed facts well and new vocabulary hinges on one sometimes shaky mechanism within memory - here are some ways to help students manage memorization:

? Emphasize context and purpose. Ask yourself why students are being asked to memorize these facts in the first place. If students can readily answer that question and if they can picture future situations in which they will use the information, they will be better primed to remember it.

? Break down new vocabulary words, especially those that are more than two syllables long. Allow time to rehearse and remember the first couple of syllables before tacking on later ones. Also keep in mind that this process will be easier for some students than others due to wide variation in phonological loop capacity; you may want to design in a ‘mastery learning’ or other individualized approach for vocabulary so that students can move through at their own pace.

? Visualize information. For most people, imagery is highly memorable, perhaps because so much of the brain is devoted to visual processing. Memory champions, such as the ones populating the best seller Moonwalking with Einstein, use elaborate visualization strategies to achieve incredible feats of memorization. Similarly, strategies such as the keyword mnemonic work by linking word sounds to images (such as using an image of a cowboy on a horse to remember the Spanish word ‘caballo,’ which sounds a bit like ‘cowboy’).

? Take advantage of the ‘Big Three’ applied memory principles - testing, spacing, and interleaving. Briefly, these refer to the facts that quizzes are a great way to study and that we do best when we spread out our study sessions and alternate between different topics. Tackling a big memory project such as human anatomy means we need every advantage we can get, and dozens of research studies have supported these three as producing the biggest memory payoff for the time invested.

? Avoid the rereading trap. Students tend to fall into passively reviewing material, and in doing so they miss the key advantage of techniques such as testing: retrieval practice. Retrieval practice strengthens memory, but it works only when we actively challenge memory. Flash cards, a favorite student strategy, are fine as long as students use them to actively quiz themselves.

It’s okay to expect students to learn the facts and terms needed to become experts in a discipline. With an understanding of memory and some strategies to share, we can make this side of learning productive and maybe even painless - but certainly at least less painful.

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