3 ways to study better, according to cognitive research

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Credit: AI-generated image (disclaimer)

Whether you are a student or the parent of one contending with coronavirus school closures, this year "back to school" means studying under some unusual circumstances.

Learning and teaching can provide great opportunities for academic and

personal growth, but in the midst of stressors, it's worth remembering that some ways of learning and retaining information are more effective than others.

For example, students report relying on age-old techniques like re-reading textbooks or notes and highlighting the important parts, but these aren't the most effective approaches. More than a century of research tells us that testing yourself with practice questions and leaving space between study sessions (sometimes called distributed practice) enhances learning and long-term memory. Ultimately, these approaches save time.

In my educational research in the department of kinesiology at Western University, I am interested in how people learn, and what small changes instructors and students can make to improve their results. My priority is to understand how novice students learn anatomy and which cognitive strategies can optimize learning, both academically and in daily life.

Enhancing learning

When practice testing and spaced studying are used together, researchers call this super technique "successive relearning" and its benefits are clear.

For example, Kent State University researchers found that students studying by successive relearning earned test scores 12 percent higher than their classmates who were using conventional methods. They also retained significantly more information when retested days and weeks after their final exams. Such a situation approximates how you might hope to use knowledge far beyond a course.

Further, a large online study of self-regulated study practices found that spaced learning appears to have the greatest benefits for students with lower final exam grades and can even buffer the effects of completing

less learning activities throughout a course.

Let's talk about how and why this works.

Retrieving information is key to retention

Only a portion of the information you learn becomes part of your permanent, or long-term knowledge. When you learn something new, your working memory holds that information in an active state, keeping it available for you to use and combine with other things you already know (long-term memory) or are experiencing in the moment (short-term memory).

This is what happens, for example, when you try to remember a phone number. While focusing on the number, you might pull in relevant information about the person you plan to call or memorization tricks you've used for phone numbers in the past.

When the information in your working memory stops being used, however, its presence fades. Its transition from newly learned to long-remembered depends on how the information was used or rehearsed.

Practicing the retrieval of information is key to long-term retention. Spacing out these sessions gives you a chance to forget just enough to make your recall effective, allowing you to remind yourself about what you learned —which enhances memory and slows forgetting.

Fortunately, almost anything from schoolwork to new languages can be learned this way.

Caution for crammers

Successive relearning may feel hard compared to typical (yet ineffective) strategies like highlighting and re-reading.

If you have been a student who has crammed for an exam, you may know that for next-day recall, cramming sessions actually do work. But students don't typically realize how much and how quickly they forget content since the course usually ends with the exam.

This means that learners may falsely identify cramming as being an easy and effective strategy and avoid more difficult yet more effective strategies like successive relearning which actually promote long-term retention.

So how do you "successively relearn?"

Break things down into three steps

Set a goal: Figure out what you'll study—like key topics from a lecture or a driver's handbook—and when you'll do it, by creating and following a schedule. Aim for shorter study sessions that are spaced out over time. For example, five one-hour sessions are better than one five-hour session .

Practice: Create opportunities to recall what you have learned to help move information into long-term storage. Online flashcard apps are great (check out free options such as Anki and Flashcards by NKO), though all you really need is paper and a pen.

If you're a student, try leaving blank spaces in your course notes to recall and write out concepts after class.

If you're teaching, build informal testing into your lessons. Beyond modeling the technique, it also helps students sustain their attention, take

better notes and it reduces test anxiety.

Consolidate success: Check your work and monitor your progress over time. If you're successfully recalling something most of the time, you can decrease how often you review that content and replace it with new content as you progress. Deliberately recalling information is the critical ingredient for successive relearning, so be sure to lock it into your memory by writing down and committing to an answer before checking your notes or textbook.

Remember that without deliberate recall practice, little information makes it into your long-term memory, which inhibits effective long-term learning.

So, put down your highlighter and try something new. Just regularly thinking about a topic and recalling the particulars is a real opportunity for success.

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