

Thriving in Academe

REFLECTIONS ON HELPING STUDENTS LEARN

Thriving in Academe is a joint project of NEA and the Professional and Organizational Development Network in Higher Education (www.podnetwork.org). For more information, contact the editor, Douglas Robertson (drobert@fiu.edu) at Florida International University or Mary Ellen Flannery (mflannery@nea.org) at NEA.

■ Teaching For Deep Learning

Would you like your students to become deep learners? Here's a simple approach to accomplish your goal.

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Do you and your trusty sidekicks, a computer and textbook, show up for class each day... because you want to help your students obtain an education that nets them high-paying jobs... because your chair likes to lurk in the hallway... because your paycheck necessitates it... or perhaps because you want to aid your institution's administrators in their quest to obtain high retention and graduation rates?

On the other hand, if you've decided that the real purpose of higher education is to instill deep learning (what Fink calls "significant learning experiences" and others, life-long learning) in your students, do you really know how to reach this goal? Do you keep current with pedagogical research? Have you noticed what brain scientists have recently discovered about learning?

Times have changed quickly. The "Sage on the Stage" is on life-support, and even the "Guide" is being forced further to the side by the "Mentor from the Middle" (see our "Teaching Creative Thinking and More"). Unfortunately, while professional development, especially in pedagogy and technology, is something we all know we need, time-stressed instructors often find it difficult to obtain.

Fear not, for in the next few pages we're going to provide a short course that will not only catch you up on the research, but make your students what you desire to see — deep learners.



Meet Charlie Sweet, Hal Blythe, and Rusty Carpenter

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an associate professor of English. Recent books include *Higher Education, Emerging Technologies, and Community Partnerships* (2011) with Melody Bowdon, *Cases on Higher Education Spaces* (2012), as well as *Introduction to Applied Creative Thinking* (2012) and *Teaching Applied Creative Thinking* (2013) with Hal and Charlie.

The Four Rs—Receive, Retrieve, Rate, Reflect

Are you old enough to remember when your elementary education was called “grammar school”? Were the three Rs of reading, writing, and arithmetic drilled into you with a hickory stick? From the Industrial Revolution through the 20th Century, the three Rs constituted the basics of a good education. But today the subject matter for an education has expanded, and research has demonstrated more scientific ways to learn. For instance, instructors

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once encouraged students to read and then reread as a way to be certain one learned the material, but we now know that commandment to be wrong.

As we point out in *Achieving Excellence in Teaching: A Self-help Guide* (2014), knowledge should be transferable and not mere surface learning (e.g., that which is crammed for a test): “Unlike surface

TALES FROM REAL LIFE > THE FOUR R’S

In a recent course, CRE 201 Creativity and Innovation, students focused on developing innovative concepts and ideas through applications of creative thinking. Their projects were largely problem-based, and the activities were focused on using creativity to develop innovative solutions. Information

was often delivered visually with the expectation that students would be inspired and that class discussions and exercises would build momentum organically. My intent was not to tell students what to think but to encourage them to think. How students received content could not lend itself to the

prescriptive but needed to foster innovation and invention while also challenging students to draw on their past experiences from class or life — to practice retrieval. In addition, students grounded their approaches based on information retrieved from the course text or supplemental readings

and viewings. While the focus of the course was creativity, each project required students to present and rate their projects. This critical thinking encouraged students to consider what they would have done differently if they had more time or different directions for solving problems that became

apparent during the process. At the end of each major project, students had the chance to reflect publicly, building off of one another’s ideas, questions, and concerns. The “Four R” approach certainly enhanced my CRE 201 students’ learning.

learning, deep-learning students synthesize (rather than memorize) ideas in order to develop a conceptual understanding—i.e., the new information takes root in their basic apparatuses for apprehending the world—and to make meaning out of material under consideration” (11). Simply put, inculcating deep learning in your students can be achieved by utilizing the four Rs.

Receive!

Like a computer, the student mind needs to receive information to function. Many delivery systems exist from on-the-ground to online, lecture (with or without PowerPoint) to mini-lecture, and many formats can be utilized (e.g., the flipped classroom). The keys are brevity and variety: after 10 minutes of any mode of concentrated instruction (see Medina), student attention wanes. If the average person is willing to spend only 12 seconds on a website, how long does it take before students click out of their reception mode? Still, without new information to add to old knowledge, new knowledge cannot be created.

Retrieve!

In order to place information in their long-term memories, students must go through the practice of retrieval. As Brown, Roediger, and McDaniel point out in *Make It Stick: The Science of Successful Learning* (2014), “Learning is deeper and more dura-

ble when it's effortable” (3). But not all effort is the same. In fact, the authors stress that “Rereading text and massed practice of a skill or new knowledge are by far the preferred strategies of learners of all stripes, but they're also among the least productive” (3), as is the “popular notion that you learn better when you receive instruction in a form consistent with your preferred learning style” (4)—e.g., auditory or visual learning.

STUDENTS MUST LEARN TO REFLECT UPON WHAT THEY LEARNED AND HOW THEY LEARNED IT.

The authors suggest several general principles of retrieval that effective instructors need to know and pass on to their students. Think of these guidelines as learning strategies applicable for instructors and coaches:

- Even in new fields of knowledge, even before you learn how to solve, give the problem a try. Making mistakes can be valuable. Let your students try to write a sonnet before you teach them its intricacies.
- Learning is best achieved by drawing on a wide array of your experiences and resources rather than simply what you do best. If you tend to be a visual learner, try the aural approach.

- Space out practice. Rather than one long cram period, placing time between practice sessions allows the brain to consolidate or strengthen connections. Try the three-part approach where practice occurs immediately after new learning has taken place, immediately before a testing exercise, and another somewhere in between.
- Interweaving or practicing two or more subjects or skills beats massed practice. Amazingly, baseball players will learn to hit curve balls better when the pitching coach mixes in a few fastballs and changeups. Likewise, practicing French vocabulary and English grammar in the same study session is helpful.
- Vary your time and place of learning. Students should study in different places and at different times. Mom sending you to your room every night after supper probably wasn't the best idea.

In *Learning to Think Things Through* (2005), Gerry Nosich offers another principle of retrieval. Since you tend to forget most of what you learn, focus not on all bits of information but on the most fundamental and powerful concepts. We once reduced our entire World Lit course to its essence with “Art reflects its culture.” As *Make It Stick* affirms, “People who learn to extract key ideas from new material and organize them into a mental model and connect them to prior knowledge show an advantage in learning complex mastery” (6).

■ BEST PRACTICES > TWO TERRIFIC STRATEGIES

The best tip we can offer you to facilitate deep learning is to quiz, quiz, and quiz again. Have a quiz at the beginning of class, after a mini-lecture, at the end of an online reading, and even at the end of class. Why? As *Make It Stick* says, “think of it as practicing retrieval of learning from memory rather than ‘testing’” (19). Thought of this way, quizzing be-

comes a tool for learning that gets more assignments read, increases attendance, provides an “easy-win” grade, forces retrieval, and offers a post-quiz time to discuss correct answers.

Remember sitting at the kitchen table with Mom turning over those old handwritten 3x5 notecards with definitions on one side and examples/resources on the

other? Well, it turns out Mom got this one right since the single best way for students to learn without the instructor present is with our old friend the flashcard. And flashcards are even easier to use now. Technology has provided us with digital versions of the flashcard that, as the *Wall Street Journal* reports, “promise to make you smarter and more produc-

tive” (D1) whether you want to learn history or French. Look into flashcard programs such as Anki, Memrise, or Cerego, where “Each digital flashcard is repeated at intervals based on the degree of difficulty for the user” (D3).



In short, if students are taught to retrieve effectively—whether through testing, discussion questions, or papers—they will learn more deeply. And don't forget to check our sidebar for the two greatest tools of teaching (quizzing) and learning (flashcards).

Rate!

A 2007 study by the Association of American Colleges and Universities claimed the number one skill desired by employers is critical thinking. As critical thinking is essentially the evaluation of argument, meaningful and immediate feedback by instructors, whether written or verbal, models such thinking. As Arum and Rotska demonstrate in *Academically Adrift* (2011), students learn to evaluate material most effectively by writing the 20-page paper. If you are looking for a way to supplement critical thinking, you might try using Paul and Elder's *The Thinker's Guide to Critical & Creative Thinking* (2005) or any of their writings that explain the Elements of Thought, the Intellectual Standards, and the Intellectual Traits. All information is not equal in value, and students must be equipped to judge its worth. As a simple exercise, regardless of your discipline, find relevant newspaper/online editorials and have your students apply the Paul-Elder or any other critical thinking model to them.

Reflect!

Students must learn to reflect upon what they learned and how they learned it—that is, thinking about the new knowledge and monitoring their learning process (i.e., become metacognitive) and you must stimulate both activities. Instructors can offer in-class and out-of-class assignments that ask daily, end-of-unit, or end-of-semester questions.

Reflective questions often take the form of synthesis questions:

- Does what you just learned in this course remind you of anything you picked up in another course?
- How does this new knowledge differ/conflict with your previous beliefs about the subject?

ISSUES TO CONSIDER

OVERCOMING COMMON PROBLEMS

Is following the Four Rs the only way to ensure deep learning? Of course not. As we mentioned earlier, the more active the learning, the deeper it penetrates. And activities that promote the higher-order skills on Bloom's Revised Taxonomy—Applying, Analyzing, Evaluating, and Creating—are most effective.

What else does research reveal about student learning? More than we can cover in such a short article. For instance, molecular biologist John Medina has compiled some new studies in his book *Brain Rules* (2008)—e.g., "Rule #1: Exercise boosts brain power"; "Rule #6: Remember to repeat"; "Rule #7: Sleep well, think well"; "Rule #8: Stressed brains

don't learn the same way"; and "Rule #10: Vision trumps all other senses." The implications for teaching are enormous. Don't let any class unit last more than 12 minutes. Have your students exercise in class. Provide pictures since images are at least six times more effective than words. "The brain cannot multitask" (84). Student knowledge is "organized around core concepts or 'big ideas' that guide their thinking about their domains" (84).

What classroom practices do not promote deep learning? Recent studies indicate that 90 percent of all P-20 classes are taught primarily through the lecture method. Lectures, like a PowerPoint, promote passivity. But even group discussions can become boring through overuse, and such discussions dominated by alphas lose effectiveness, especially for class omegas. Units that last



longer than 15 minutes tend to lose impact and energy. Under 20-page papers will not have as much effect on student learning as longer papers. And how many classes did you ever take if the dreaded term paper was due on the last day of class? Did your caring prof mail you a copy of his comments or even her grade on it? What did you learn from doing that paper other than hate writing papers and the subject of that paper? Handing back a test long after students took it and not reviewing the test questions immediately are two strategies found in the Worst Practices Hall of Fame. And never throw the textbook at your class while sternly admonishing them, "If you don't understand, you'd better reread it!"

Metacognitive questions might be:

- What was the most difficult thing to grasp in class today?
- What was the easiest thing to grasp?
- Have you noticed any pattern to the things you consider difficult to learn, easy to learn?

Students can also be encouraged to keep journals or even to "pair-and-share" with other students. To paraphrase a famous saying, unexamined learning is not worth pursuing—and it certainly isn't deep and lasting.

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