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Creative Course Design (Yes, You Can!)

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A lot of teachers don't think of themselves as being particularly creative. Creativity in education doesn't mean coming up with a revolutionary new idea or complete reinvention of something. Creativity means doing something original or unique. A lot of educational creativity involves repackaging or "putting your own spin" on something that somebody else has already used successfully. We believe in adding your own stamp and style to already existing educational approaches—that's being creative. Sometimes all that's required to take a course or lesson from sleepy to exciting is a small, but personal, creative adaptation. It is almost always easier to modify than to create *ex nihilo*.

Every program, course, and lesson can be made more effective, efficient, and exciting. What we're suggesting is illustrated by IDEO—a California-based design and consulting firm that specializes in product and process improvement. The design principles they use can readily be applied to educational course design.

Sometimes we lack creativity in education because we work in isolation. Collaboration with colleagues fosters creativity. IDEO, for example, uses a team-based design methodology that consistently results in product designs that no single team member could have created (see https://www.youtube.com/watch?v=M66ZU2PCIcM). Here are some of the principles they use when collaborating as a group—repurposed with an emphasis on course design:

> ***Sometimes all that's required to take a course or lesson from sleepy to exciting is a small, but personal, creative adaptation.***

- *Encourage wild ideas.* Too often we end up doing what we've always done. We're busy and need to get lesson plans, assessments, and assignments completed in a hurry. But take a moment, consider an ideal teaching situation: What would you do for your students to help them succeed and master your course? Let your imagination run loosely. Of course, there are constraints, but letting them go (just temporarily) can help unlock new solutions to old problems. "Blue sky" brainstorming can yield imaginative, yet realistic possibilities.
- *Defer judgment.* Whether you're doing individual course design or working as part of a committee, it is easy to criticize new ideas. How often do we tell ourselves and others: "That won't work." "We don't do that here." "We tried that ten years ago, and it didn't work then. It won't work now." "Your students will hate it." It's easy to become "problem spotters" instead of "problem solvers." Early criticism kills the seeds of creative solutions. Like pulling up plants when they are still seedlings, ideas need time to take root if they're going to bear fruit.
- *Share everything that you've learned with colleagues.* Sharing insights with others helps clarify and sharpen ideas. There are many times and places to share good ideas and best practices—informal luncheons, at the water cooler, during workshops, via email or text, while working out at the gym—the list is endless. Exactly what you do with colleagues depends on your colleagues and your institution's culture. Don't be insular. There is wisdom in crowds; "we" are always smarter than "me."
- *Stay focused.* Don't try to fix too many things at once. Focus on areas that need the attention or are currently of the most interest. Look for creative solutions rather than trying to fix everything at once. We also recommend tackling problems when they occur. Don't let them fester but get focused on different approaches that could be taken.

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In This Issue

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Institutional Climate for Teaching and Change Adoption

There's no question that the climate for teaching at an institution has a direct impact on teaching at that institution, especially when it come to the value placed on teaching. It also influences the motivation to keep working on teaching. But what exactly makes up the teaching climate? Climate is a great metaphor. It means that the conditions that surround teaching and learning influence how teachers and students feel about it, just like the weather influences daily decisions about what to wear. But climate applied to teaching is a metaphor. What's being described has nothing to do with the weather.

A research team at Boise State set out to measure the climate for teaching at their institution. Their first research question involved trying to identify reliable and valid components that make up what's referred to as climate. They were also interested in the process of instructional change and wanted to see if they could develop a measure that would allow faculty to identify where they were in the process of adopting evidence-based practices. And finally they wanted to explore how their measures of climate and adoption might be useful to campus leaders and how they related to a set of demographic variables in the sample.

What they found is institutionally specific, in other words unique to Boise State. The researchers describe how they arrived at and then empirically assessed the items listed below. Each item was worded positively on one side of a seven point scale and negatively on the other side.

"I believe the campus culture . . .

- is generally supportive of teaching / is generally unsupportive
- limits the choice of teaching methods / allows choice of teaching methods
- promotes faculty-centered teaching / promotes student-centered teaching
- values research more than teaching / values teaching more than research
- is student-success oriented / is not student-success oriented
- connects me with other teachers / isolates me from other teachers
- does not value teaching in hiring decisions / does value teaching in hiring decisions
- discourages me from trying new teaching techniques / encourages me to try new teaching techniques
- values the assessment of learning outcomes / does not value the assessment of student learning outcomes
- values teaching more than research in promotion and tenure decisions / values research more than teaching in promotion and tenure decisions
- is shaped by leaders who are not supportive of my teaching / is shaped by leaders who are supportive of my teaching
- encourages the use of evidence-based instructional practices / discourages the use of evidence-based practices
- does not value teaching / values teaching
- does not allow faculty to use any method they choose / allows faculty to teaching using any method they choose
- breeds divisiveness in teaching discussions / breeds collaborative teaching discussion
- is characterized by high faculty-student rapport / is characterized by low faculty-student rapport

These questions were followed by eight more that asked specifically about the respondent's teaching.

This work also attempted to identify stages in the adoption of change. Starting with previous research work, the team adopted a five-stage process:

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Encouraging Classroom Participation Through In-Class Reviews

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I teach introductory biology classes; the students in these classes are typically new to the discipline at the college level and often find the amount and level of material challenging to absorb and retain. However, many students are nervous about asking or answering the questions I ask. Typically it's only a few of the well-prepared students who respond to the comprehension questions I pose. The less-prepared students keep their heads down. But students need to interact in class for me to determine the level at which they are understanding the material or struggling with it. Cold-calling feels threatening to many students and makes them even less likely to engage. I use an in-class review strategy to overcome this situation.

Before class starts I write questions on the board from material covered in the previous class period. While I'm setting up the computer and taking attendance, students have time to prepare their answers. I encourage them to work in pairs. Peer mentorship is helpful in this case. Working with partners gives students more confidence in their answers. This is time students would otherwise spend checking their phones or chatting with friends. Instead they're consulting their notes and discussing course content with a neighbor.

My questions take diverse forms. Some ask for definitions, others for lists of criteria, or examples that illustrate a concept. Sometimes I create tables to facilitate compare and contrast questions. It's easy to summarize a large amount of material on a table. I may provide diagrams that need labels or problems to solve. My questions help students learn what topics are most important, and the review gives me an opportunity to ask both simple recall as well as application questions. When covering new material that draws on content presented earlier in the semester, I use the review to refresh students' memories and get us to the same take-off point. Occasionally I will include a review question verbatim on the test. This reinforces the importance and applicability of the review questions, and it allows me to gauge how well students have prepared for the exam.

There are three ways I call on students to answer the questions. Sometimes I start with a student in one corner and proceed student by student having them answer each successive question. With this strategy, they know when they'll be called on and it allows a bit more time for preparation. Occasionally, I cold-call on students. To avoid having individuals feel targeted, I blindly pick a card with the student's name from a shuffled deck. After the student answers the question, I let them choose the next card. This distances me from the selection, and the students enjoy being involved in the process. This strategy ensures there's no bias involved. Every student has an equal chance of being chosen. The third way I call on students incentivizes volunteering. I let the students choose the question they'll answer. Those who volunteer first have the greatest choice; they can pick the question they are most confident in answering. This approach also gives the activity a game-like feel akin to *Jeopardy*. Where I've created lists to complete, each student fills in one item. For compare and contrast tables, each student fills in one box. With diagrams each student identifies one structure. For any question I may ask the student for follow-up information.

From my perspective, the in-class reviews work very well. The questions are well-defined, and the timing allows students to prepare answers, thereby fostering confidence in their ability to answer correctly. It's an approach that gives students some sense of control. Student feedback verifies that from their perspective the reviews are helpful. For example:

- "The teacher asks questions at the beginning of class. At first this was terrifying to me because I am not good at science but I feel as though this time teaches me a lot."
- "I love the way (the instructor) will 'recap' the previous lecture at the beginning of each class. This not only builds on the foundation of what was learned but also strengthens it."
- "I really like how she makes sure that everyone knows the material before moving on."
- "I enjoyed how we had review questions from the previous class at the beginning of the class. I found that to be helpful in my understanding of the lessons."

I use the technique in biology classes, but I can see it working in a wide range of disciplines. If only a few students typically speak up in class, these approaches are non-threatening ways to call on students. The in-class opportunity to prepare answers encourages student participation. My reviews signal the beginning of class. They remind the students of what we've already covered, where we ended, and that that helps sets a foundation for new material. Although I do this at the beginning of class time, the activity could be used in the middle of a class to reinforce content and check comprehension. When students actively use information they are in the process of learning, they are more likely to remember it and to understand its complexities.

'Do You Have Time to Talk?' When Students Look to Professors for Help

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Frequently college students seek emotional support and personal advice from faculty members with whom they have had supportive interactions. Faculty need to balance the idea of helping students with their more formal role as instructors, working to figure out appropriate boundaries.

In recent years this issue has taken on greater significance. More students come to college with mental health histories, campuses debate the use of "safe spaces" and "trigger warnings," and political and social tensions have risen across the country. Reasons like these make it important to reflect on the conversational strategies we use when students come to us for help unrelated to course content. Our goals need to include providing the best help for the student, taking care of our own work/life balance issues, and staying inside the scope of our roles and areas of expertise. Below are some strategies that can help accomplish those objectives.

Start with listening and supporting

- Ask students what would be helpful. Are they simply looking for a place to vent, do they want help with solutions? Or are they needing someone to be involved? Keep in mind that sometimes all students need is someone to listen.
- Don't act too quickly. Maybe start with, "I'm sad to hear that," or "I'm sorry to hear you have been struggling."
- Don't assume that the student is without other support, that you'll be their only support, or that you must be their only support. Talk with the professionals on campus who deal with students daily and see if they are already aware of the student's concerns. It is a compliment when a student seeks out a professor for help. But the teacher's first obligation is gathering the information and making referrals to places where the student can find help.
- If the student is emotionally upset, it may be hard to hear what you tell them. Even if the student appears to be listening, it's still a good idea to provide instructions/referrals in writing (keeping a copy) or ask the student to summarize your feedback before leaving.

Refer to campus resources

- If the issue is straightforward, say difficulties with a roommate, it is helpful to have a standard set of information to share, such as a list of campus resources and their contact information. Include the counseling center, student disability services, student affairs, and financial aid offices.
- For more serious concerns outside areas of expertise, develop questions that will help you decide what to do next before getting too far into details of the problem. Consider using closed-ended questions such as, "Do you have a support system?" "Do you have a plan for how to take care of yourself?" "On a scale of 1 to 10, how ready do you feel to get help with this?" "Do you need referrals?"
- In cases that involve mental health or safety concerns, it is better to be safe than sorry. Refer the student to student affairs or the campus counseling center so that someone can follow up.
- If it's a mental health issue that feels as though it requires immediate assistance, ask the student if you can call the counseling center from your office or, volunteer to walk with him or her to the counseling center.

Know the boundaries

- Know the mandated reporting requirements on your campus for Title IX and for harm to self or to others.
- Communicate the limits of confidentiality in honest, straightforward, compassionate, but non-apologetic ways. Use university-provided materials about mandated reporting. Students are often unaware of reporting requirements and will find it very helpful if you explain that you'd like to help, but there are more appropriate and more confidential resources on campus.
- Sometimes it's preferable not knowing all the details of a student's problem. Too much information (positive or negative) can unintentionally influence subsequent responses to the student and his or her work.
- Students are often unaware of privacy laws, so it might be appropriate to explain that faculty members should not know certain personal details about students' lives. Only student disability services or the campus counseling center have the right to know private medical information.
- What if you discover information about a student through your role as a "friend" on social media? Consult the university's rules for mandated reporting to learn the appropriate response.
- How much should a teacher self-disclose when speaking with students about their concerns? Although there are no hard-and-fast rules, it helps to keep in mind your role as an instructor. Sharing information about your graduate school application process or job interviews is more likely appropriate than disclosing your personal emotional struggles.

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The Future of Teaching

Who knows what it might be? At this point no one can say for sure. However, it's a pretty good bet it won't be the same. Some scholars, Michael Wertheimer and William Woody among them, propose dramatic changes for the future professoriate. They base their predictions on the "radical technological and cultural transformation" currently underway. (p. 284) Their objective in proposing how a professor in the future might be teaching prompts this question: "How should today's faculty in psychology and across the university, intentionally develop new skills and approaches to fit the coming academic world?" (p. 284) In other words, the future is better-prepared for now than later.

The sticking point, of course, is what the future will bring and that's what makes this article such a good one for discussion. Wertheimer and Woody start out with stark facts that do have clear implications for the future. Attitudes about a college education have changed. 75 percent of the public in the US sees college as unaffordable and 57 percent say it is not worth the cost, according research reports cited in the article. Other citations report that only 50 percent of recent grads think their degrees were worth the cost. How are faculty responding to these significant changes in attitudes about higher education? Or are the changes just being ignored?

The article does an excellent job of highlighting teaching in the 20th century, starting with the lack of training to teach and this pithy query: "Does *anyone* really know how to teach someone to become an effective teacher?" (p. 285) There's also the teaching-research disconnect and resulting disparity between the two, amplified by how teaching effectiveness is assessed with student ratings. Institutions changed dramatically across the century so that by its end "many colleges and universities had. . .succumbed to a kind of business model. . ." (p. 286) Expectations grew that faculty scholars would "contribute" to the institution by securing external grants and contracts. Throughout the last century and continuing today, the lecture prevails despite "slim at best" evidence that it effectively promotes learning. (p. 287)

But not for long. These authors propose the lecture's demise. "The electronic revolution not only makes enormous amounts of unrelated information readily accessible to everyone and anyone; it is also radically altering what professors do." (p. 289) MOOCs, which do have their problems, are precursors of what's to come, according to these authors. Brilliant lecturers will carry the load, teaching thousands with great economic efficiency. "Professors will no longer lecture but will conduct small seminars, engage in one-on-one apprenticeships and tutorial sessions, and facilitate informal or formal student-student interactions." (p. 290)

They also propose that teaching will become more evidence-based. They point to the "enormous literature" in various fields and on many topics related to learning. "There exists a myriad of published studies the results of which have not yet been responsibly translated into practical applications." (p. 289) They claim that this work has started and is desperately needed for that time in the future when faculty will be teaching in small group settings that will make them more directly responsible for the learning experiences of students.

These authors are not the first to prognosticate about the future, predict the demise of the lecture or propose a dramatically altered form of higher education. Some of those previous predications have come to pass; others have not. It's hard to argue with the points these authors make as to the financial unsustainability of the current model given what can be learned via technology at no or a fraction of the cost. In light of that, questions must be raised about the viability of physical campus locations. Those on the other side regularly remind that in democracies there's a need to educate the citizenry and teach critical thinking. Wertheimer and Woody contend teaching those skills has already been compromised across all levels of our educational system.

What's most useful about a piece like this is the thinking and discussion it can provoke. Things will change. When and in what ways are not yet clear, but might become clearer if they were considered and discussed. There's no arguing that the best time to prepare for the future is today. —*MEW*

Reference: Wertheimer, M. and Woody, W. (2017). The professoriate in the 21st century—with some speculation about impending changes. *Scholarship of Teaching and Learning in Psychology, 3* (4), 284-298.

Time to Talk

FROM PAGE 4

If you're worrying that the conversation is blurring into the realm of personal counseling, remember that academic or career advice usually involves more task-oriented discussions and direct advice-giving while emotional counseling entails more listening, interpreting, and processing. When you're unsure how to proceed, it is always a good idea to consult campus offices that regularly deal with student issues and problems. Faculty are a valuable resource for students. Sometimes we are the first to know when a student is struggling with personal issues. Thinking through these conversations before they occur can make them go more smoothly, and most importantly, help the student connect with appropriate resources as seamlessly as possible.

Modifying Strategies

Let's start with an example. In a recent issue of *College Teaching*, Forrest Cooper describes how he modified the well-known and widely used "Think-Pair-Share" strategy. It continues to be an effective way to get students talking with each other about course content. But Cooper's goal was to make the strategy even more learner-centered.

In his modified version students come to class with two questions based on their assigned reading. The "think" part involves generating questions that can't be answered with simple recall. Class opens with students "pairing" and then asking and answering each other's questions. Next, the students count off and form groups of about five but not with their partner in the group. The group answers every member's questions and then selects the two "best" that they will ask the instructor. Cooper answers the first couple of questions directly but then uses the questions to open class discussion. He reports that since students have been selecting the questions, their investment in the activity has increased. He also thinks that having students work on the questions in groups has improved the quality of their questions overall.

This use of "Think-Pair-Share" holds students accountable for doing the reading and it then uses the assigned reading as a foundation for what will be covered in class. This modified version of the strategy gets even more student interaction and it's designed to develop question-asking skills.

Faculty regularly modify strategies, making them work with course content and responsive to the learning needs of students. Most teachers make modifications almost automatically, guided by an intuitive sense of what will and won't work given the content, the students, and the teacher. And that's fine, but what if the process were a bit more systematic and thoughtful?

It could start with why the strategy was selected in the first place. Why is it being used? What were the intended goals? To what extent are those goals being accomplished—from the teacher's perspective and from the students' perspectives? Next, the strategy can be dissected, taken apart at the seams. What routinely happens when students "Think-Pair-Share?" If that's not all it could or should be, what could be changed? What about giving students a scenario to discuss, or three solutions to the problem or two potential exam questions to answer? Maybe the sharing needs to be broader? How might it work if three students were involved?

Even small design details can make a difference. How often should a strategy like this be used? When should it be used? Should you ease students into the content at the beginning of the period or give them a break in the middle? Could it occur online? What happens if students always share with the same person, or always with a different person?

It's easy for teaching strategies to fall into comfortable ruts. We know how we use them. It's a part of class prep we don't have to worry about. We do it as we've done it before. That works for a while, but then it doesn't work as well as it once did. That should signal that it's time to modify the strategy, to fiddle with parts—fix, repair, or replace. And suddenly an old faithful like "Think-Pair-Share" offers students a whole new learning experience. —*MEW*

Reference: Cooper, F. (2018). A modification of "Think-Pair-Share" to make it more learner-centered by using student-generated questions. *College Teaching, 66* (1), 34.

Course Design

FROM PAGE 1

- *Build on the ideas of others.* You may know the popular song "Hallelujah" by Leonard Cohen. Actually, you probably don't know the original version. Chances are you're familiar with the one Jeff Buckley popularized or you've heard the one in the animated movie *Shrek*. The original song was not particularly popular, but later artists recognized its potential. They built on the original, taking it in slightly different directions and adding their own individual styles. As a result, "Hallelujah" has been recorded hundreds of times by various artists and is a popular hit. (You can link to a podcast that explains the evolution of the song here: http://revisionisthistory.com/episodes/07-hallelujah.) The same general process can happen in education. Creative teachers often just slightly tweak or alter existing approaches, and over time that results in better courses.
- *Fail often in order to succeed sooner.* Fear is the thief of creativity. Failing is part of learning—for teachers as well as students. Interesting though, isn't it, how some teachers go to great lengths to avoid introducing anything risky in their course. In our careers, some of our most meaningful classroom sessions involved something that didn't work quite right the first time we tried it. Fear of trying something new limits options and possibilities. A teaching failure—whether it's an assignment that didn't quite work, exam questions that were misunderstood, or an approach that just didn't connect with students—is not a sign of a bad teacher. It's an opportunity to learn and grow.

Creative course design is within your reach. Don't be put off by the idea. The tasks need not be overwhelming. If you are willing to experiment with these principles and apply them to your courses, don't be surprised when you discover that you, too, are a creative person.

Encouraging Students to Use the Dictionary: The Results

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Previously in *The Teaching Professor* (31.7), I wrote about my efforts to help students get what John C. Bean in *Engaging Ideas* (2001) calls the "Dictionary Habit." As I wrote, I had always assumed that my approach to teaching the "Dictionary Habit" was effective. However, a student email inquiring about the meaning of the word "dwellings" alerted me to the possibility that my approach was perhaps too teacher-centered. In other words, I began to wonder whether I had inspired this student to turn to *me* for a definition rather than a first-class dictionary like the *Oxford English Dictionary* (*OED*). In short, up to that point, I had been the one choosing what words we would look up as we read through texts, at least on most occasions. After the student's email, I decided to try something new, something more organic. As a self-described "dictionary enthusiast," what happened fascinated me.

I created a "Dictionary Exercise" for the two sections of each of the two courses I teach (four sections in all). For the one course, students had to look up two words during their reading of the book *River Out of Eden* by Richard Dawkins. The students could choose words they did not know or words whose particular usage was unfamiliar to them. After choosing their words, they had to write down the sentences from Dawkins in which each word appears, and cite the proper definition for each word as provided in the *OED*. For the other course, students did the same thing, but they had to choose their words from stories and poems by Edgar Allan Poe.

I culled the results of 23 students' exercises from one section where students worked from the Dawkins text. The students had looked up two words each for a total of 46 words. Amazingly, there were 42 *different* words in all! The words included "equilibria," "gunwales," "morsel," "parsimonious," and "spawn." Only four words were repeated on different students' assignments, and each of those only once: "erroneously," "insuperable," "pernicious," and "progenitorial." I had not anticipated the out-and-out variety of words, which taught me a lesson about the diversity of students' reading experiences.

In one section of the course where students worked from the Poe texts, there was also substantial variation, though not quite as much. Still, these results offered me their own special lesson. In this sample, 26 students looked up two words each for a total of 52 responses. Among these 52 responses were 33 different words, including "hogshead," "intemperance," "pallid," "phantasm," and "surcease." Moreover, nine words were repeated, four of them more than once: "obeisance," "sagacity," "sepulchre," and "seraph." The word "sepulchre" was repeated seven times, the most by far. Interestingly, the word "sepulchre" has become part of my personal lexicon—probably from my years of reading Poe. As a result, and misguidedly, it is most likely *not* a word I would have chosen to look up with my classes! Nonetheless, my experience in this instance reminded me that I should be continually challenging my own assumptions.

Indeed, although it seems as if it should be obvious, especially in hindsight, one semester of these exercises has made me more fully aware of the fact that individual students' critical reading experiences present discrete challenges. I cannot assume that students' encounters with texts will usually mirror those of other students or my own. As I noted in the previous article in regard to Mary Wollstonecraft's use of the verb "sophisticate" in *A Vindication of the Rights of Woman*, there are times when the class as a whole can focus effectively and meaningfully on a single word-related reading lesson. I do not plan to dispense with such moments. However, I have recognized that a more organic approach to encouraging students to use the dictionary adds a critical dimension that likely benefits students in ways that teacher-centered moments simply cannot.

Climate

FROM PAGE 2

1. **Awareness:** where the adopter is passive and doesn't have much information about the change.
2. **Curiosity:** where the adopter is seeking information about the change
3. **Mental tryout**: here the adopter is imagining how the change might work if he/she tried it.
4. **Hands-on tryout:** the adopter has made a commitment to the change, has opinions about it, and asks implementation questions.
5. **Adoption:** the change has been made, the adopter can make suggestions about it and may seek expertise for answers to detailed questions.

Measuring climate and stages in the change process means taking something abstract and defining it in ways that are more concrete. Even though such measures still lack precisions, they make it easier to understand what's potentially involved. Additionally, the items themselves as well as a collection of responses to them do make for interesting discussions. —*MEW*

Reference: Landrum, R. E., Viskupic, K., Shade, S. E. and Bullock, D. (2017). Assessing the STEM landscape: The current instructional climate survey and the evidence-based instructional practices adoption scale. *International Journal of STEM Education, 4,* 10 pages. [Note: this is an open-access journal.]

The Science of Learning Can Improve Teaching

In the 2017 Hans O. Mauksch Address presented at the American Sociology Association annual meeting, Melinda Messineo argues that we aren't using as much of the science of learning as we could to help students learn. "In many ways, our efforts in the classroom are trial and error, and while much of what we do works, we are not aware of why it works, so the results are difficult to replicate. If we understand more about why the strategies we use work, we can potentially increase learning." (p. 8)

She supports her argument with evidence—the responses of 145 sociologists to an online survey she created. Asked about their familiarity with how the brain learns, roughly one-third of the group reported greater familiarity, one-third said little to no familiarity, and the final third said moderate familiarity. She followed this ranking question with an open-ended request to briefly describe how the brain records and retrieves information. She'd already asked many questions, so maybe survey fatigue was an issue, but a number of respondents skipped the question, a third who did answer owned up to gaps in their knowledge and the rest provided "varying degrees of detail" including a number who offered descriptions that didn't actually answer the question. The next question asked these faculty to identify two strategies they used to help students learn.

About their answers to this question about strategies, she writes, "What is most poignant for the purposes of this piece is how little was mentioned in terms of strategies employed to help students master the metacognitive aspects of learning. Even with some awareness of brain science and the science of learning, it was infrequently tapped as the solution to a learning challenge." (p. 7)

After making the case that perhaps sociologists (and we could add, the rest of us) might profitably use more of what is known about learning, she provides five examples:

Metacognition: Expert learners approach learning differently than novices do. They know when they've read something and they don't really understand it. They read it again, perhaps breaking it down until they get to parts that they do understand. They may seek out resources that can clarify what they aren't understanding. Experts are able to examine their own understandings with a degree of honesty. They aren't afraid to identify gaps. Those are skills students need to develop. Messineo suggests early in the course giving students a difficult paragraph from a reading they will be assigned later in the course and having them attempt to identify main points, their thoughts about the passage, and the feelings they are experiencing as they try to read it. They could talk with a peer about the material and together identify what needs clarification. It's an exercise that attempts to model what expert learners do when they read something challenging.

Experts are able to examine their own understandings with a degree of honesty. They aren't afraid to identify gaps. Those are skills students need to develop.

Attention: Expert learners know when they're focused and know to intervene when their minds are wandering. Learning doesn't occur without focus. Here Messineo recommends having students mark in their notes where they lose focus (where they start thinking about how they ought to check their phones). She also suggests taking breaks during class sessions, providing attention-resetting experiences during which students stand up, or talk to those nearby.

Multitasking: It reduces accuracy and efficiency and "drastically" decreases learning and retention (p. 9), and this is a fact most students don't know, according to Messineo. When learners quickly switch from one task (re-reading notes) to another (responding to a text), they end up paying partial attention to both tasks. Students need to experience these effects. Messineo offers a simple but highly effective activity. Have students write down the alphabet as they count out loud from 1 to 26.

Guided practice: This is not a busy work practice, as in rote memorization, but a kind of focused practice that occurs within some context. It's a practice that's guided by an expert who provides feedback. Messineo points out how frequently faculty are disappointed in student performance. An exam question asks them to integrate and analyze; they respond with descriptions. But have students been given opportunities to practice integration and analysis? It is a practice that develops the skill that can then be demonstrated in performance.

Empathy: Empathy helps people learn. "Brain scans show that seeing individuals experience joy as well as suffering activates those centers in the brain of participants as well, often as if they were experiencing the emotion themselves. . . Emotions and thoughts are powerful teaching tools." (p. 10) Activities that incorporate role-playing often promote empathy as do personal narratives such as those heard on *StoryCorps*.

Understanding more about the science of learning can make us better teachers. Applying that knowledge in our courses can make students better learners. —MEW

Reference: Messineo, M. (2017). Using the science of learning to improve student learning in sociology courses. *Teaching Sociology, 46* (1), 1-11.