

Understanding



devoted the introduction to Part One to convincing you that spending class time helping students acquire knowledge was time well spent—that we can’t offload this crucial task to Google™ or expect previous courses to have taken care of that fundamental work. I probably don’t need to kick off Part Two by convincing you of the value of helping students to develop understanding, to improve their problem-solving skills, and to become more effective writers or presenters. You probably conceive of your role as a teacher primarily in terms of doing that work, as indeed you should. If you are reading this book—or any book like this one—you are also likely already a practitioner of teaching strategies that foster what we might label active learning, in which students spend at least some time *doing* things in the classroom rather than merely sitting there passively. However, the literature that you will see cited in the next three chapters suggests that to assist students in developing their comprehension or acquiring complex cognitive skills such as solving math problems or interpreting a poem, we have to do more than invite questions, hold discussions, use group work, or assign online drill work. We may certainly want to do some or all of these things—but if

we do them, we must do them deliberately, with eyes wide open, and with the help of the literature on human learning. Too often, instructors assume that teaching by discussion (or group work or . . .) rather than lecturing will automatically translate into active learning, and deeper understanding. Unfortunately, this is not always the case.

The current term that springs to mind when college and university teachers think about active learning is the flipped classroom, which has become a catch-all phrase used to describe classroom structures in which students gain first exposure to course content outside of the classroom and then spend their time within the classroom doing things like solving problems, thinking critically, and writing. This structure—which has been standard operating procedure in many humanities classrooms for decades now—flips the traditional model of higher education in science, technology, engineering, and mathematics (STEM) disciplines, in which instructors provided first exposure through lectures in the classroom and then sent students off to *do* things outside of class. The explosion of new teaching technologies in recent years has enabled more and more instructors to flip their classrooms in this manner and has led to the rapid spread of flipped classrooms in American higher education—not to mention the rapid spread of positive publicity. A press release from a company that promotes learning resources designed for flipped classrooms reported triumphantly in 2013 that around half of all college and university teachers either have tried the flipped classroom or are planning to do so in the near future. Further, “among those employing it already, 57% of faculty agrees that their flipped classroom is ‘extremely successful’ or ‘successful’” (Sonic Foundry 2013). This could strike us as a positive development, given that the majority of instructors are having a positive experience with bringing active learning strategies into their classrooms. But even without being

a math professor, I can note that this survey result means that 43% of instructors using a flipped classroom approach are seeing either no improvement in learning or even reduced learning from their gymnastic (and often work-intensive and time-consuming) restructuring of their classrooms.

Robert Talbert, a mathematician and regular contributor to the *Chronicle of Higher Education* who writes frequently about flipped classrooms, notes correctly that opening up the classroom to cognitive activities (rather than simply lecturing and presenting information) represents nothing more than a framing strategy that can have very mixed results:

The flipped classroom does not automatically provide. . . outstanding learning experiences. What it provides is *space* and *time* for instructors to design learning activities and then carry them out, by relocating the transfer of information to outside the classroom. But then the instructor has the responsibility of using that space and time effectively. And sometimes that doesn't work. [Italics in original] (Talbert 2014)

Careful and strategic design, in other words, matters in the flipped classroom as much as it matters in every other type of classroom, from a large class lecture to a small seminar discussion. I have been teaching the literature professor's version of the flipped classroom since the start of my career now; students read literary texts before class and then come to class and we talk about how to interpret them. But I have walked away from far too many of these discussions, even lively and interesting ones, wondering whether anyone *learned* anything—and especially, whether anyone had acquired something looking like a skill that would help them write their papers or take their exams more effectively.

This applies in the flipped classroom: just because students are busily working away at tasks at their desks doesn't mean they are learning anything. ⁻⁵

I still remember a Renaissance literature course I took as an undergraduate in which the instructor put us in small groups with instructions to discuss key passages of whatever text we were studying that day. I loathed those sessions, saw them as pointless, and can assure you I learned nothing from them. Looking back now, through the lens of many years of teaching and reading about teaching and learning in higher education, I can see multiple problems with the way those sessions worked: we had no real task to complete, beyond the vague injunction to discuss the passages; the teacher offered no guidance or supervision while we worked and instead did something inscrutable up at the front of the room; and although a connection may have existed, she did not articulate for us any connection between what we were doing in those group sessions and what we did on our essays or exams. In his introduction to college teaching, *The Missing Course: Everything They Never Taught You About College Teaching*, David Gooblar points out to new teachers that “active learning strategies in and of themselves are not a magic bullet. You can’t just use the strategies; you have to know how to use them well” (Gooblar 2019, p. 19). The same holds true for us all. Certain kinds of interactions and feedback are more likely to promote learning than others, just as certain kinds of cognitive activities are more likely to promote learning than others.

The three chapters in this section offer small teaching strategies that should help you design active learning moments in your classroom—whether you think about those moments as flipping or not—in ways that are brief, powerful, and supported by the research on human learning. Any one of the strategies you’ll find in these three chapters could become the basis for a full- or even multi-class activity, and the strategies often do serve that function

in my own classroom. However, I have tried in the Models section of each chapter to provide examples and ideas for how they could fit into the framework of small teaching. Some of them describe how to conclude a class session with a 10- or 15-minute small teaching activity, and you might think about those activities as the most appropriate ways to conclude a lecture or discussion. But the three major concepts in this part of the book—connecting, practicing, and explaining—could also serve as key design principles for a flipped class session, for effective group work interactions, or for creating new homework assignments or assessments.

The small teaching approaches described in Part One all centered on helping students gain a strong knowledge foundation through effective first exposure and then carefully planned sequencing, repetition, and retrieval. Building learning, though, doesn't quite work like building a house, as we saw in our chapter on interleaving. You don't need or even want to completely master one cognitive activity before moving to the next one. Similarly, as students are developing their knowledge base, they should also be exploring and testing methods to use that knowledge for a wider range of cognitive activities. The following chapters will give you a set of small teaching tools for creating classroom or online experiences that deepen student understanding, improve the ability of your students to analyze and improve their own learning, and become mindful practitioners of a range of cognitive skills.

Chapter 4

Connecting

INTRODUCTION

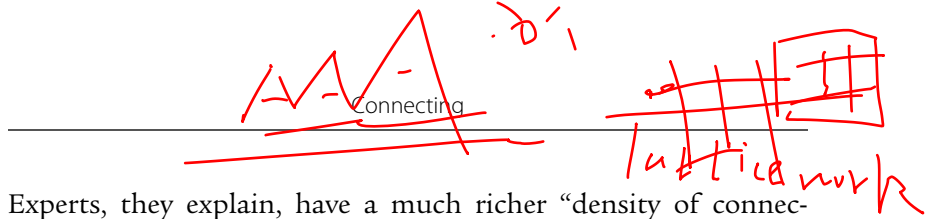
Although you probably know him primarily as the author of *Animal Farm* and *1984*, British writer George Orwell produced a massive amount of fiction and nonfiction in his lifetime; his complete body of published and unpublished writing totals more than 8,000 pages. Since my disciplinary research in British literature focuses partly on Orwell's work, I've read much (though not quite all) of Orwell's writings, including *A Clergyman's Daughter*, a novel that was little read when it was published and perhaps even less read now. I count it as one of my favorite of Orwell's works, though he had a different opinion of it; he disliked it so much that he forbade it to be republished during his lifetime, after the original printing. The novel's protagonist is Dorothy Hare, the daughter of a selfish and indifferent rector living in the English countryside in the early part of the twentieth century. Dorothy undergoes a traumatic incident in the first half of the novel that results in her waking up in London with total amnesia. After bouts of homelessness and seasonal farm work, she finally winds up as a teacher in a small private school outside of the city. When she first encounters her new pupils, who range in age from 5 or 6 to their late teens, she concludes with despair that the mechanical and rote methods of instruction of their previous teachers have

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been spectacularly ineffective. Whatever knowledge the students have ~~consists of~~ “small disconnected islets” (Orwell 1986, p. 209) in a vast sea of ignorance. Those scattered bits don’t add up to much, Dorothy realizes: “It was obvious that whatever they knew they had learned in an entirely mechanical manner, and they could only gape in a sort of dull bewilderment when asked to think for themselves” (p. 209).

I don’t find my students gaping at me too often in dull bewilderment. But Orwell’s description of Dorothy’s students—one that likely stemmed from the several years he spent teaching at an English boarding school—caught my attention when I first read it because it does capture an experience I have encountered in the classroom more times than I would care to count. It typically happens when I begin pressing students to make connections between disparate sets of concepts or skills in a course—asking them, in other words, to build bridges between the disconnected islets described by Orwell. For example, when we are tackling a new author in my British literature survey course, I might begin class by pointing out some salient feature of the author’s life or work and asking students to tell me the name of a previous author (whose work we have read) who shares that same feature. “This is a Scottish author,” I will say. “And who was the last Scottish author we read?” Blank stares. Perhaps just a bit of gaping bewilderment. Instead of seeing the broad sweep of British literary history, with its many plots, subplots, and characters, my students see Author A and then Author B and then Author C and so on. They can analyze and remember the main works and features of each author, but they run into trouble when asked to forge connections among writers.

That problem is especially acute at the beginning of a semester. In *How Learning Works*, Susan Ambrose and her co-authors offer a clear explanation for that by noting the different ways novices and experts in a field process and position new knowledge.



Experts, they explain, have a much richer “density of connections among the concepts, facts, and skills they know” (Ambrose, Bridges, DiPietro, Lovett, and Norman 2010, p. 49). When they encounter a new piece of information or a new idea in their field of expertise, they immediately slot it into a fully developed network that enables them to see connections between it and dozens of other things they know. When I encounter a new work in recent British literature, I can immediately see how it connects to other similar works, to major events in British history, to a specific region of Britain, or even to current events there. My students, by contrast, are novice learners in the field; their knowledge of it, to borrow a phrase from *How Learning Works*, is “sparse and superficial” (p. 46). Especially at the beginning of a semester, Ambrose et al. explain, students might “absorb the knowledge from each lecture in a course without connecting the information to other lectures or recognizing themes that cut across the course” (p. 49). They don’t know enough about British history to understand that Scotland and England have a complex and fraught history and that therefore we might find connecting threads between Scottish authors in terms of how they write about their neighbors to the south.

In short, they have knowledge, in the sense that they can produce individual pieces of information in specific contexts; what they lack is understanding or comprehension.

And they lack comprehension, even more shortly, because they lack connections.

IN THEORY

James Zull is a biologist whose career took an interesting new turn when he began to reflect on how a better understanding of the biology of the brain could help teachers do their work more

effectively. The title of his first book, *The Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning* (Zull 2002), articulates nicely the major point he wants teachers to understand: **when we learn anything new, we are making changes to our brains. When we are helping other people learn new things, like our students, we are making changes to their brains.** It would seem only natural, then, that a little bit of understanding of how brains work should accompany our efforts to change them. Since the last science course I took was Concepts in General Science more than 30 years ago, you can imagine how welcome I find books like Zull's, which translate the research of brain researchers into imagery and language accessible to English professors like me.

To understand the link between *making connections* and *building comprehension*, on which this chapter focuses, consider for a moment Zull's depiction of what happens when we learn. Our brains are filled with cells called neurons, which do the work of what we call thinking. A human brain has at least 100 billion neurons, and those neurons contain branching structures called axons that allow them to communicate with other neurons; they do so not by touching the tips of the axons together (as in a handshake) but through the release of chemical neurotransmitters into a tiny space between one neuron and the next called a synaptic gap. As Zull puts it, in his folksy way, neurons "make friends easily" (Zull 2002, p. 96). A single neuron can form literally tens of thousands of connections with other neurons, both near and far away. (The axons can extend as far as six feet.) Neurons form new connections with one another with every new experience we have: new sensations, new thoughts, new actions. As the neurons are connecting to one another in novel ways, growing and strengthening new connections, they are forming networks. The first time neurons link up in a new way, that connection is a temporary or fleeting one; if that connection is used again (because we repeat

the thought, or recreate an experience), the link strengthens. The more times the pathway is used, the stronger the connection.

→ With that brief summary of your brain under our belts, we can now better understand Zull's explanation of how learning constitutes a change in our brain—a change, more particularly, to our neuronal networks:

“The knowledge in our minds consists of neuronal networks in our brains, so if that knowledge is to grow, the neuronal networks must physically change. This is the change that a teacher wants to create. It is change in connections. . . unless there is some change in connections, no learning can occur”

(Zull 2002, p. 112). According to this definition, we learn when our brains form new neuronal networks or modify existing ones as a result of our experiences; this means that, quite literally, learning requires the continual formation of new connections between our neurons. Think back to the image that Orwell gave us, which now seems quite apt: an individual and isolated piece of knowledge, one that students can't do much with, is exactly like a disconnected islet—just as Dorothy observed in her students. It has few connections to other neuronal networks in our brain. An initial neuronal connection might form when a teacher tells us some piece of information and will fire again in a very small and limited range of circumstances. A piece of knowledge that we understand thoroughly, however, and that we can reflect deeply on and apply to new contexts and more, will have connections to lots of other neuronal networks. It might have come in from the teacher, but then we recognized how it related to something we already knew; we thought about it when we saw something similar in a movie later that day; later still we were able to use it in an essay we were writing. Each of those new uses of that piece of information connected it to another set of networks, until it eventually sits at the heart of a dense weave of connections—what we normally think about as understanding or comprehension. (Readers can find

another excellent and more recent presentation of the research on learning-as-neural-connections in the first chapter of Oakley, Rogowsky, and Sejnowski's excellent book *Uncommon Sense Teaching: Practical Insights in Brain Science to Help Students Learn*, which was on press while I was working on the second edition of this book.)

Hence, a simple way of understanding how to build comprehension in our students would be one that consists of helping them forge rich, interconnected networks of knowledge—ones that enable each existing piece of information in our content area to connect with lots of other information, concepts, and ideas.

Shifting our language from the biology of the brain to the ways we normally think about student comprehension, we want them to have rich frameworks of knowledge in our content areas, ones that enable them to connect and organize information in meaningful and productive ways. In the past several chapters we have considered how we can help students form and strengthen primary new connections in their brains—creating strong wiring that will allow them to retrieve course content when they need it. In this chapter we consider how we expand those connections into networks that enable students to see the bigger picture, make meaning, apply what they have learned into novel contexts, and more. Our role as teachers now expands as well: we want to facilitate the process of students making connections. As an expert in your discipline, your network is thick with connections. As a teacher in your discipline, your task is to help your students develop a denser, more richly connected network of knowledge and skills in your course content areas.

The more connections student have in a knowledge field, the better they are able to learn and remember new knowledge in that field—which may be the most important reason to emphasize connections in your teaching. This notion is illustrated by a famous little study on memory that was conducted by British psychologists

in the early 1980s (Morris, Gruneberg, Sykes, and Merrick 1981). The researchers in this case showed a list of football (soccer) scores to more than a hundred undergraduates at the beginning of a lecture; they were not told to memorize them, however. After a brief interval the students were given a test designed to check their knowledge of football, with questions like: “Who is the manager of Birmingham City?” The lecturer then showed them the list of teams from the beginning of the session and asked them to fill in the scores they had been shown previously. When the researchers compared the results of the two tests, they found that a stronger understanding of football corresponded with a better ability to remember the scores. This experiment is usually used to illustrate the importance of prior knowledge on our learning of new material, an idea we considered in the chapter on predicting.

But if you reflect on what happened in this experiment, you can see how it provides a handy demonstration of the power of connections. The students who had a general knowledge of football would have been able to assign meaning to the scores they had been shown, and that meaning would have come in the form of connections between the scores and other things they knew about those scores. For example, they might have noticed that one score represented an upset: a team with a historically poor record had upended a championship-caliber team. Or they might have remembered that one of the teams had recently acquired a star player and thought about how that star player could have affected the outcome of the game or about how a particular score meant that a team was going to advance to the upcoming playoffs. In all of these cases, what the knowledgeable students had was a rich network of connections among lots of different facts about football—individual players and their histories, the current and past win-loss records of favorite teams, recent trades—and that rich network of connections enabled them to take in the *new* piece

of information (i.e., the football score) and put it into a meaningful place. The more we can help students develop rich networks in our content areas, the more we enable them to build meaning and comprehension of what we are teaching them.

But we have to finish with an essential qualification here. You can't fire the synapses in your students' brains. For the connections to be meaningful and effective, the students have to form them. Your task is to create an environment that facilitates the formation of those connections rather than simply lecturing them about connections. Believe me, I speak to my British literature students about connections between various authors and events in British literary history all the time. However, just telling them about those connections isn't enough. They have to build up the connected networks in their own brains—with our help. In her book *Teaching Students How to Learn: Strategies You Can Incorporate Into Any Course to Improve Student Metacognition, Study Skills, and Motivation*, Saundra McGuire points out that most teachers do a good job of modeling connection-making for their students; what we have to work a little harder at is letting students do some of the work themselves:

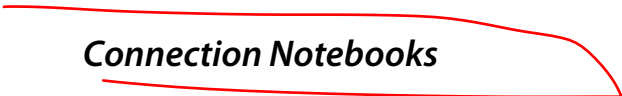
We don't have to make the connections for them; in fact it is much better if we don't. We can just throw a concept out there, like a ball, and ask, "What does this remind you of that you've encountered in your everyday life?" When students hit the ball back, they come up with the most wonderful examples and ideas that give them not only an efficient path to learning and mastery, but also *the most efficient path for them*. (McGuire 2015, p. 26)

This last point is an important one. When you make a connection for your students—pointing out, for example, how some course concept connects to a recent pop-culture controversy—you

are making a connection that resonates with you. But your students may have zero interest in the kind of pop culture that fascinates you, and so that connection won't do much for them. When you invite and encourage them to devise their own connections, they will be necessarily more meaningful to them.

MODELS

Strategies to help students modify and enhance their connections can fall at any point during the semester or during any class period. The following five strategies include opportunities for students to activate prior knowledge at the beginning of the semester, to build connected networks throughout the semester with and without technology, and to prepare for final exams and projects as they are finishing the semester. Small teaching here takes the form, not only of brief activities within and outside of the classroom, but also of single-class activities that will help students forge connections within a semester's worth of material.



Connection Notebooks

One of the earliest methods that readers and scholars used to create connections among the things they knew was the commonplace book. A unique combination of diary and scrapbook, commonplace books served as a repository in which people could record passages from their favorite books, treasured quotations and epigrams, inspirational Bible verses, recipes, thoughts, and almost anything else that the person wanted to preserve or remember. They were such a useful and popular item that the English philosopher John Locke authored a guidebook for commonplace-book writers. Commonplace books can serve the same function for students today as they did for people hundreds of years ago—helping

them retain and connect what they know and what they are learning. The random juxtapositions that happen when people keep commonplace books not only helps with retention and connection, but it can also spur creative thinking as students see course topics intersecting with other ideas in new and original ways.

I began using a version of the commonplace book, re-christened in my class as *connection notebooks*, while I was completing the first edition of this book. They have since become my favorite small teaching strategy, and they always seem to catch the attention of faculty audiences in the small teaching workshops I give. At the beginning of the semester I hand my students a blue exam book and tell them to bring it to class every day. Once a week, at the end of class, I ask students to take out their connection notebook and write a one-paragraph response to a connection question or prompt I pose to them. Here are some examples of the kinds of questions and prompts I have used:

- How does something you learned in class today connect to something you have learned or discussed in another class, whether it was college or high school or even elementary school?
- Explain one way in which the day's course content manifests itself on campus or in your home lives.
- Can you identify a television show, film, or book that somehow illustrates a course concept from class?
- Describe how today's course material connects to last week's.
- Connect today's course material to a current political or cultural event that's in the news right now.

Sometimes students write their responses to that day's prompt and then class ends, but sometimes we start this activity a few minutes early and I invite a few students to share what they have written before class ends. I collect these notebooks just three times throughout the semester and count them toward a

small portion of the course grade. They get full credit for that grade as long as they write me a paragraph. This will be the easiest assignment in this course, I tell them—all you have to do to earn an A on your commonplace book is come to class and write your paragraphs.

The final minutes of class can be a rushed and pointless experience, as we are raising our voices over the clamor of students packing up their things and getting ready to spring for the door. Connection notebooks—which can also be completed online through a discussion board—can slow down those final minutes of class and make them more productive. When you invite your students to make connections in this very deliberate way, you will find yourself surprised at the fascinating connections that students make between your course material and the world around them. But you won't hear those connections—and they might not get made at all—unless you ask for them.

Provide the Framework

As you are introducing new course content to students, especially in the form of course lectures, one way you can help them avoid Orwell's "disconnected islets" is by providing them with the organizing framework of the material and letting them fill in the details. Students are better able to make meaningful connections when they are making them within a visible structure. New learners in a subject tend not to see the structure of a knowledge field—they focus on the details. One way to address this problem in practical terms is to provide students with the outline or framework of your lecture notes and let them fill in the details. This way they can see the larger connections in the field, but they still have to do their own work of making new connections as they listen and observe. Researchers have demonstrated the positive impact of providing such structured (but incomplete) notes in at least two

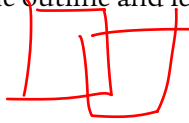
different ways. One experiment compared the exam performance of students who received the full set of lecture notes versus those who received partial notes, and found that the partial-note students performed better on the course final exam (Cornelius and Owen-DeSchryver 2008, p. 8). Another researcher worked with medical students, and again put them into two groups: one group was left to take notes on their own, and the other received guided notes from the instructor, which included “a structured tree map model that identified and summarized the main points of class discussion.” Here as well, the researcher found that students who had received the guided notes—with a visual map of the content framework—outperformed the no-notes students on the course exams (Gharravi 2018).

Giving your students guided or structured (but incomplete) notes provides them with the framework of the lecture or reading content, but still forces them to do some of the work of recording ideas and making their own connections. The small teaching strategy here is to help your students make sense of course lectures by providing them with the framework at the outset. You could hand out hard copies of such framework for them to take notes on during class; you could post it to your learning management system so they can take notes on their laptops; or you could simply write the skeletal outline and key terms on the board prior to the start of class. My observations of instructors in multiple disciplines throughout the past 12 years or more has suggested to me that most of us don’t think very strategically about the positive role that boards can play in student learning. We tend either to cover them with our notes or to use them to write down ideas or comments that strike us as important in that moment. Setting aside a small section of the board that contains an organizing framework and facilitates students taking meaningful notes and

building up rich knowledge networks could help provide some meaning to that kind of impressionistic board use.

Overall, when it comes to providing students with the material from your lecture slides or any other course content, remember that smaller is better; you will help them connect most deeply if you provide only the outline and let them do the rest of the work.

Concept Maps



A rich literature exists on the use of concept maps (also sometimes called mind maps), which present a fast and easy method to help students visualize the organization of key ideas in your course. I like the use of concept maps in particular for group exercises, since group work so often falters when students have not been given a clear task with a concrete outcome, or been given a task that they find too easy or too challenging. The creation of a concept map is a manageable task for a small group of students to undertake at the conclusion of a lesson or a unit of material and offers the additional benefit of being an interesting and (in the best of all possible worlds) even enjoyable activity. The phrase *concept map* essentially describes the activity; Ambrose et al. define a concept map simply as “a visual representation of a knowledge domain” (Ambrose, Bridges, DiPietro, Lovett, and Norman 2010, p. 63). Concept maps can be constructed on sheets of paper, on posters, or on tablets or computers with or without the help of concept-mapping software. One can use concept maps to allow students to construct a visual depiction of everything they know, with key concepts located in boxes or circles in the center of the map and then lines branching off those central concepts or ideas to other subsidiary elements: other concepts, supporting points or details, examples, and so on (think about the image of all

those neurons connecting to each other in your brain). The lines between the different elements of a concept map can be labeled in ways that define the relationships between them.

An even better use of concept maps, though, is to provide students with a focus question to which the concept map comes as a response. So a historian might ask students to construct a concept map that demonstrates the positive and negative consequences of violent revolutions; an environmental scientist could assign a concept map that asks students to depict all of the consequences of some major climatological event. I have had my students create concept maps around the major characters in a single novel or around the appearance of a key theme in multiple novels. Even better still, follow the suggestion of *How Learning Works* and have students make multiple maps with different organizing principles. As the authors explain, “Giving students practice organizing their knowledge according to alternative schemata or hierarchies helps them see that different organizations serve different purposes and thus builds more robust and flexible knowledge organizations” (Ambrose, Bridges, DiPietro, Lovett, and Norman 2010, p. 63). If I ask students to create a map of novel characters one day, I might ask them to create one around its themes on a second day and yet another around its images on a third day.

In the early days of my teaching career, I used to have my student groups construct concept maps by giving them blank overheads and asking them to create their maps with dry erase markers; this allowed us to spend the latter part of the class taking a quick look at everyone’s maps on the overhead projector. Nowadays, I am more likely to stop at the bookstore before class and pick up some posters and markers and have them create their maps on a larger scale. But you might not prefer these ancient tools of the trade, or you might be teaching in an online environment, or you might have too many students to supervise and display all of the maps produced in your class. Fortunately, a wealth of free

concept-mapping programs now exists for your students to create online versions of concept maps. Just search for “free concept mapping,” and you will find yourself with more options than you know what to do with. You can find programs to download and save to your device, and you can find websites that allow you to begin creating a new map instantly. Some learning management systems even include concept-mapping options within them, so you might begin by checking there first if you are teaching in a blended or online environment. If your students are accustomed to taking notes on their devices in class, using technological tools for concept mapping will help you keep the activity small without worrying about using things like posters or overheads.

The Minute Thesis

After close to 20 years of teaching, and more than half that time studying and writing about teaching in higher education, I have had exactly one good idea for a teaching strategy that I can’t trace back to anywhere else; everything else I have ever recommended, in this book or elsewhere, comes from someone or somewhere else. My single good idea consists of a game called the Minute Thesis, and it represents in some ways the germ of this book, in that it constitutes an ideal small teaching activity: free, easy, and capable of use in any size class, for any length of time you wish, from 10 minutes to the full class period. I began using it about 12 years ago as an attempt to help students at the end of the semester see connections across the various works we had read in an effort to develop ideas for their final papers—which mostly, in my classes, require them to do comparative analyses of several works from the course reading list. I wrote the name of the seven novels we had read on the board in a single column; in a second column, I wrote a list of themes that we had seen in various novels throughout the semester. I handed a marker to a student in the front row,

asked her to walk up to the board and circle a single theme, and then asked her to draw lines connecting that theme to two different novels. Then I invited all students to spend 1 minute thinking about a thesis for an argument that would explain how those two novels connected to that theme. Some of them stared off into space, thinking; some of them actually wrote a phrase or sentence in their notebooks. After a minute (maybe two), I asked them to tell me what they had come up with. A brief silence ensued (this always happens); then a tentative hand arose, and a tentative student made a tentative statement. I praised the student's idea and asked for another. More hands arose, more confidently, and more ideas emerged. After 5–10 minutes listening to the fascinating new set of connections that were emerging, I stopped the discussion and handed the marker to another student, asking him to circle a new theme and connect it to two different novels; the process then began anew. Over the course of a class period, the students created dozens of brief thesis statements that connected the novels and themes of the course in new and interesting ways, and many of the students took an idea they expressed in that class period and developed it into their final paper.

This brief little activity occurs in the final week of every class I teach now, as a way to help students solidify existing connections they have developed or envision new ones as they are preparing for their final papers or projects or the final exam. The potential variations in how you might conduct it are endless, as are the ways technology could modify or enhance it. You could, for example, use your course learning management system to start a handful of discussion threads that pair various course elements in different ways and ask each student to contribute a one-sentence thesis to that discussion thread over the course of a 24-hour period; to push their thinking even further, you might then assign students to articulate what the supporting evidence would look like under someone else's thesis. In the classroom

you could likewise play out each iteration of the Minute Thesis further by selecting one thesis from those initially proffered and spending 10 minutes spelling out what the argument might look like. Or you could use three columns instead of two, requiring the students to think even more creatively about how to see the course material in newly connected ways. All that's really required is that you or the students set up columns or categories of essential course concepts or texts, connect them in new and creative ways, and then ask the students to describe how or why those connections make sense (or even don't make sense). In this way, just as in the practice of giving students an outline and key terms and letting them fill in their notes, you are offering the scaffolding through the columns or categories but then requiring students to make the connections themselves.

One final benefit of the Minute Thesis is that it can help students gain some practice in what might seem to them the mysterious process of coming up with new or original ideas—something we frequently ask of them when we assign papers or presentations or research projects. What we typically think about as “original” thinking usually means forging new connections between things that have not been connected before (Lang 2013, pp. 192–205). Ideas almost always have lineages, and those lineages can help us see the key role that creative connections play in the process of generating new thinking. Playing the Minute Thesis demystifies the process of coming up with new connections, and gives the students a tool they can use in all of their classes when they are trying to brainstorm ideas for their assignments.

Examples, Analogies, Reasons



I'll wrap up the models of this chapter with a more general recommendation for how to keep connections at the forefront of your thinking about teaching. You will help your students expand and

grow their knowledge if you give them prompts and structured opportunities to make connections. No matter what your class looks like, seek regularly to prompt students to respond in some way—through writing, class discussion, paired conversation, polling, and more—with the following three questions:

- Can you give me an example?
- What's it similar to? Or different from?
- Why should we care about it?

These questions will encourage students to make connections through examples, analogies, and reasons—all of which should contribute to deepening their learning. Build these questions into your practice and use them to keep students engaged and thinking throughout your course.

PRINCIPLES

Connection exercises provide a bridge between your expert comprehension of your subject matter and the novice understanding of your students. As you consider how to help your students create their own connections, keep that primary focus in mind. You are helping your students obtain the big-picture view that informs and animates your own grasp of the material.

Provide the Framework. Remember that one of the most important ways your knowledge of the course content differs from your students lies in your ability to organize and connect concepts and information in meaningful ways. As you encounter new knowledge in your field, you can remember and work with it because of that organization. New learners in a field initially need lots of

help in seeing the framework or organization of the material to be learned. You can help them by making the framework as visible as possible, pointing them back to it frequently, and helping them recognize where new material fits into the frame. The more familiar the students become with your course content, the less of this you will have to do.

Facilitate Connections. The network of connections in your head doesn't transfer wholly into the heads of your students. Providing the frame to your students not only will help them better understand the organization of knowledge in your field but will also leave open the space for them to create the connections in their brains that will fuel deep learning. Be creative in developing techniques that allow students to see unexpected juxtapositions, chart new pathways through the material, or invent their own new knowledge networks. Be present as the guide and expert who can provide feedback on their discoveries, and help nudge them in productive new directions when they get stuck or stray too far from what you know works for experts in the field.

Leverage Peer Learning Power. Of all the small teaching techniques considered in this book, this one lends itself most easily to the use of groups or peer learning activities. Your students all share the position of being novice learners in your field and can help each other understand how to build bridges between those disconnected islets. When you are providing opportunities for students to create connections, allow and encourage them to help each other. The process of creating connections lends itself to collaborative exercises that can revitalize the classroom and inject some fun into learning. The days on which we play the Minute Thesis game are always the most enjoyable ones of the semester; the room fills with energy and curiosity as the students make their own connections and consider the connections made by their peers.

SMALL TEACHING QUICK TIPS: CONNECTING

Making new connections is more complex than retrieving a remembered piece of information, so you may need to set aside more space and time in your course plans for connection exercises. Rather than trying to squeeze them into five- or ten-minute sessions in class, see if you can allot them more time in single-class sessions at the opening, midway point, or closing of the semester.

- Use connection notebooks to help your students connect that day's course content to some aspect of their lives or experiences outside of the classroom. Make the notebooks a very low-stakes assessment activity—and enjoy seeing all of the fascinating connections your students make.
- Consider providing students only with the scaffolding or framework of lecture material in advance of class; let them fill in the framework with their own connections.
- Ask students to create concept maps that answer questions or solve problems. Use concept maps multiple times throughout the semester with different organizational principles.
- Consider using the Minute Thesis or other in-class activities that help students see or create new connections prior to major assignments or exams.
- Build into your teaching approach frequent opportunities for students to come up with their own examples, analogies, and reasons.

CONCLUSION

In *A Clergyman's Daughter*, protagonist Dorothy Hare discovers an ingenious method for connecting the disconnected islets of her students' minds in their history lessons:

She bought a roll of cheap plain wallpaper at an upholsterer's shop, and set the children to making an historical chart. They marked the roll of paper into centuries and years, and struck scraps that they cut out of illustrated papers—pictures of knights in armour and Spanish galleons and printing presses and railway trains—at the appropriate places. Pinned around the walls of the room, the chart presented, as the scraps grew in number, a sort of panorama of English history. (p. 222)

This active learning strategy of Dorothy's incorporates just about everything we have considered in this chapter: providing a structure that helps students see the big picture (the chart), having them fill in the connections across and between the elements of that big picture (the historical dates), and inviting them to bring in new connections from outside of the class (the illustrated papers). With the help of this simple framework provided by the teacher, Dorothy's students begin truly learning.

Chapter 5

Practicing

INTRODUCTION

In spring 2007, I taught a course on contemporary British literature to a class of mostly junior and senior students. To supplement the novels and plays and poems we were reading with some broader cultural context, I asked each student to give a 10–15-minute presentation to the class on a British work of art in a popular genre. They could offer presentations on films, television shows, or even their favorite music. I thought the assignment would elicit some strong work since it gave students the opportunity to present on topics in which they were interested—one student selected Pink Floyd’s *The Wall*, another did the BBC television series *The Office*, and so on. Leading up to the days on which the presentations occurred, I gave the students a few tips on effective presentation techniques, enjoined them to practice at least two or three times before the final classes, and worked with some of them individually on the structure and organization of their material. I had high hopes, which were painfully dashed on presentation day. The students had clearly not practiced or timed their presentations out. The slides were poorly designed and crammed with text—which the students often read out word for word. The students were either nervous and stilted or overly casual and unpracticed. The presentations were supposed to last 10–12 minutes;

one student spoke for more than 30, despite frequent injunctions to wrap things up. In fact, their work was so poor that I decided afterward I would never ask my students to give presentations again. I just couldn't stand the thought of sitting through another set of them.

However, in fall 2008, I agreed to teach a course in our honors program in which juniors produce a proposal for a thesis they will write during their senior year. The program requires that these juniors finish the course with an oral defense of their proposal—which meant that, just a semester after taking my no-presentation vow, I was stuck once again with observing and evaluating end-of-semester presentations. The stakes were now raised: each student in the class worked with a faculty mentor, who was asked to attend the defenses. These presentations would thus take place in front of an audience of my peers. In part because of these raised stakes, and in part because of my previous experiences with presentations, I decided that I simply could not bear to sit through another set of unpracticed, ill-prepared, poorly timed rambles. I had to do something to better prepare the students to succeed at these presentations. Unfortunately, I have no degree in public speaking and have never taught speech, so I didn't feel qualified to give detailed instructions on the finer points of designing presentations or public speaking. At the same time, I speak a lot in public. I do this not only as a professor speaking to students, but also as a frequent guest speaker at faculty development workshops, or lectures on other campuses. The one thing I have learned from that experience has been the value of repeated practice. The more times I give a specific lecture, or even mini lecture, the better it gets. Before I unveil any new material at a workshop, I have usually delivered it to my cat or to an empty classroom at least once or twice. As I have gained more experience as a speaker, I rely less on these practice

sessions, but even now I still will usually run through the opening five minutes of a presentation at least two or three times.

This seemed to me like a gift I could give to my students as they prepared for their presentations. So as the final weeks of the semester in this honors class approached, I made an announcement to the students: “On the class before the presentations begin, you must be prepared to give the first two minutes of your presentation to the class. That’s it—just the first two minutes. Rehearse it and be ready.” With 15 students in a 75-minute class, and figuring time for transition and critique, that meant I had to give up one whole class period to this practice session—no content that day at all, just helping them improve their presentations. Given my previous experiences with the poor quality of student presentations, I was not at all sure that the effort would be worth the lost time. I still had no particular advice in mind to offer; my only real goal was to force the students to rehearse a few times, after which I hoped they would recognize the value of their rehearsals and do some additional practicing on their own.

Rehearsal day arrived. I selected a volunteer and asked the first student to begin. I let her speak for about three sentences, which were stiff and clearly memorized, before I stopped her.

“Hang on a second,” I said. “Start over.”

“Did I do something wrong?”

“Nope. I just want you to start over.”

She began again, speaking a little more confidently. I let her go another few sentences.

“Wait,” I said, interrupting again. She wore a pained expression. Students were looking at me, and at one another, with bewilderment.

“You’re not doing anything wrong,” I said. “But just start over again for me.”

A chill descended on the room at that moment, as students began to wonder why I was torturing this poor woman. Her third time around was much better, as she found her way into her own words, so I let her continue for a while. At the end of some technical explanation she gave about her material, I asked her to stop and describe it for me in her own words without looking at her notes. She put down her notes and broke out of the rigid posture in which she had been standing to explain what she meant. It came out a hundred times more clearly.

“That’s better,” I said. “Say it like that in the presentation.”

“OK,” she said, and then resumed her presentation where she had left off.

“No, no,” I interrupted. “Say it like that *right now* in the presentation.”

“Go back and do it again?” she said.

“Yes, go back and do it again. And don’t look at your notes.”

And so it went for the next 70 minutes, as I asked student after student to repeat false starts, clear up technical material or jargon, and put away written notes. The room went from a climate of fear and anxiety to one of laughter and relaxation as the students picked up on what was happening and saw that all I was trying to teach them were the virtues of practice and rehearsal. I can’t say there were not a few bad moments. One student was so nervous and stammering it was painful to watch, and I thought interrupting her would do more harm than good. So I just let her talk. Eventually she realized that nobody was going to rescue her, and she locked in and worked her way through her nerves. The following week the students gave their presentations, and they were, by far, the best student talks I have ever seen. It could not have been clearer that every one of them had gone back to their rooms and rehearsed and timed themselves until they had it right. Some were better than others, but even the worst would have beaten out almost any presentation I had seen before.

IN THEORY

College classes frequently operate in a strange fashion if we think of them in contrast to other pursuits that human beings attempt to master. A professor spends a semester lecturing to her students about some complex subject matter. A good professor mixes those lectures with some active-learning strategies such as discussions and group exercises. But mostly in class the students are listening or talking. Then the first midterm period rolls around, and now the students are doing something quite different from listening or talking: they are writing essays, or answering multiple-choice questions, or designing presentations, or doing a variety of other complex cognitive activities that are distinct from the simple acts of talking or listening. If we taught students to play soccer in this way, it would entail putting them into the stands at a soccer game, lecturing to them about soccer, and encouraging them to have discussions about it. Then we might have them do a bunch of calisthenics. Then we would stick them in a stadium full of fans and tell them to play soccer. I suspect you would enjoy watching that soccer game about as much as I enjoyed watching my student presentations before I taught that honors class.

The small teaching strategy to be recommended in this chapter lies at the heart of this section and the heart of the book as a whole:

Students should have frequent opportunities to practice in class whatever cognitive skills that you want them to master, and that you will be assessing for a grade.

The trick in this recommendation lies in how specifically you identify the intellectual skills of that *whatever*. It may seem to you that holding an in-class discussion about a text serves as good preparation for writing an essay about that text. Those are

two different things, though. To sit and listen to a discussion, contemplate ideas, and occasionally lob out one of your own constitutes something radically distinct from sitting down with an idea, parsing it out into pieces that can be separated into paragraphs, marshalling evidence for each paragraph, and so on. “It is virtually impossible to become proficient at a mental task,” writes cognitive psychologist Daniel Willingham, “without extended practice” (Willingham 2014, p. 107). If we want students to become proficient at the specific mental tasks that we are planning to assess—such as writing formal essays or responding to essay exam questions, writing lab reports, taking multiple-choice or true–false or short-answer exams—we have to give them extended practice at those tasks. Each of these types of assessments, and any other type of assessment you can dream up, requires students mastering a specific set of cognitive processes—none of them are exactly like any other. Students, like the rest of us, can demonstrate real mastery of one type of cognitive process while having little skill with a related one. You will perhaps know this from your experience meeting and working with students who can think very quickly on their feet in class discussions but can’t write very well, or those who can write brilliant essays but rarely make substantive contributions to class discussions. This point was driven home to me firmly the year after I taught the honors class, and became the director of the honors program, where I began teaching the writing-intensive introductory course for the program’s first-year students. Sometimes I would read the poorly-written essays of a particular student and wonder how on earth she had been admitted to the program with such poor writing skills; then later on I would learn from one of my colleagues that she was brilliant at mathematics or science. My unspoken assumption had been that the really smart and talented students would be able to quickly master any cognitive challenge we threw at them; my experience did not bear out this assumption.

Neither does the research of cognitive psychologists or learning theorists. “As far as anyone knows,” writes Willingham in *Why Don’t Students Like School?*, “the only way to develop mental facility [at a cognitive task] is to repeat the target process again and again” (Willingham 2014, p. 115). The first edition of *Small Teaching* contained several pages of theoretical support for this claim, but in this second edition I have trimmed that material significantly. In the talks and workshops I have given for faculty over the past five years I have discovered that most people grasp this point readily, especially when they reflect upon their own experiences both as learners and teachers. Most of us have had the experience of having to practice something again and again in order to get it right, whether that is swinging a tennis racket or learning to cook or even making use of a particular teaching strategy. To get it right, we have to do it many times: trying, making mistakes, correcting them, and trying again. Most of us have also had experiences similar to the one I describe in the introduction to this chapter: witnessing smart and capable students failing miserably at some novel task that we assumed they should be able to master just because they had been able to complete some related but different kind of task. Many readers have actually reported to me that they have had similar experiences with student presentations in particular.

But I still want to address a common response that is given by faculty who accept the idea that students should have multiple opportunities to practice whatever cognitive skills we expect them to demonstrate on our assessments, but who are still reluctant to dedicate class time to such activities. According to these faculty, that’s what homework is for. Why should I devote my valuable class time, they wonder, to allowing students to work on writing grammatically correct sentences or developing core math skills or answering multiple-choice questions or giving pieces of their presentations? Why can’t I give them the instruction they need to

practice those tasks and then send them off to complete that practice on their own? Aren't we just coddling students and wasting class time if we draw such practice activities into the classroom, even if we are doing so—as I will recommend—in the 10–15-minute periods that are the hallmark of small teaching?

To answer these questions, we have to dig a little more deeply into the idea of practice and consider the work of Harvard psychologist Ellen Langer. Decades of Langer's research on cognition and learning are distilled in a brief but wonderful book called *The Power of Mindful Learning*. Langer's concept of *mindful learning* can help those of us who teach understand that there are really two challenges when it comes to practice in the classroom: ensuring that students do it, and ensuring that students do it *well*. Orchestrating opportunities for students to practice a skill is essential, but of course we want to make sure that their practice is effective: that it locks in the essential skills, helps them apply those skills in different contexts, and provides a foundation for future skill development. Not all practice will do that. Mindless repetition of an activity, which might look like practice, can actually lead to what Langer calls *overlearning*, in which we engage in some activity so frequently that we continue to practice it in the same way over and over again, even when circumstances change and call for adjustments. Many years ago, when I first learned to ski and did so frequently, skis had the same width at the back end and the middle as they did at the front end. Fifteen years later, when I began skiing again after a long hiatus, skis had changed: now they are shaped, which means that they widen at the front and back—and that executing turns as you ski down the mountain requires a different set of bodily movements. I knew this because someone had told it to me, but I still couldn't figure out how to do it. I just kept doing what I had always done, fighting against the shape of my skis—not because I wasn't trying but because I couldn't understand how

to move my body differently. I had overlearned my ski habits and could not adjust them to the new circumstances of my shaped skis. Langer's research suggests that the same thing can happen with the cognitive tasks we give to our students. Asking them to drill the same tasks over and over again on their homework puts them on autopilot and prevents them from refining and further developing their skills in the way that experts continually do.

Langer's theory of mindful learning provides a pathway to practice that enhances learning but doesn't lead to such overlearning. She defines a mindful approach to learning as having three characteristics: "the continuous creation of new categories; openness to new information; and an implicit awareness of more than one perspective" (Langer 2007, p. 4). First, the learner must be willing to shift and develop the categories that will guide her through a cognitive task. If the learner is using Theory A to guide her through a problem-solving session and finds herself stuck in a dead end, she should have the ability to recognize that Theory A might need modification or even need chucking out and replacing with Theory B. A mindful learner cannot simply plug and chug formulae, in other words. Second, the learner must be attentive to new information that might be blocked from view by her usual approach. A rote learner will complete a task the same way every time, not noticing variations in the landscape or challenges within the problem that might help her further develop her skill levels. Mindful learners get in the habit of pulling their heads up and looking around to see what they might be missing. Finally, the mindful learner recognizes that perspectives are always limited and that final conclusions are always provisional. She accepts the possibility that new and better approaches to a problem might yet arise, and she remains open to the potential value of perspectives she doesn't inhabit. The three components of mindful learning, taken together, represent both activity and attitude: the activity

involves monitoring and questioning one's approach to a routine problem or challenge; the attitude involves openness to the possibility of change.

I was nudged into mindful learning on the slopes by a friend of mine who had undergone the same shift I had from straight to shaped skis. He pointed out several small body movements that I was doing incorrectly, so with his advice in mind I became a much more deliberate skier. I had to think more carefully about what I was doing as I carved my turns down the mountain, and I learned to pay much closer attention to what my hips were doing, accept feedback from my body and the terrain, and make continual adjustments. Over time, I had to do less and less of that, as the new habits became more automatic to me. There are two essential points here. First, I am now a much more thoughtful skier than I ever was and enjoy the challenges of approaching and navigating different terrains in ways that I had lost when I was just thoughtlessly whizzing down the mountain. Second, even though I learned to ski more mindfully, I still had to engage in constant practice in order to master this new skill. If anything, the need for me to engage in more mindful skiing inspired me to practice even more than I otherwise would have, when I was locked into unproductive patterns. Becoming a mindful practitioner made my practice more interesting, and paved the way for it to work.

The theory of mindful learning might help you in your work and leisure habits as it helped me with my skiing. But our real challenge is to put this theory into practice in the classroom: How do you help students mindfully practice the skills you want them to obtain? Consider, for the last time, my skiing example. In that case a more experienced skier pointed out what I was doing wrong and still will occasionally ski behind me and give me a pointer here and there if I ask him to. He observed my practice, gave me feedback on what I was doing, and then continued to monitor my progress and

be available when I got stuck or had questions. The importance of his presence during my practice finally leads us back to the question I posed previously: why can't we just provide students with instruction and then send them off to practice on their own? Because doing so will leave them open to the possibility that they practice mindlessly, overlearning skills or developing poor habits instead of engaging with the task in the kind of mindful ways promoted by Langer. If you are present when they are engaged in their practice, however, you can play the role of my skiing friend: you can provide feedback while they are working, you can occasionally ask them to pause and reflect upon what they are doing, and you can offer suggestions for creative new pathways that they might try when they get stuck on a problem. You, in other words, are the best guide that students have toward mindful learning and toward practicing in ways that promote mindful learning—but you will best serve as that guide when you are present to them during their practice, whether that means standing in the room with them or interacting with them online.

Even though this still might sound like a complex task, don't overthink it (bad advice to give academics, I know). The models of this chapter will walk you through the core steps. Just to demonstrate how simple it can be to help learners engage in more mindful practice, though, consider an experiment conducted by Langer and two colleagues designed to test whether they could help students learn to practice the piano mindfully. Two groups of musical novices were given some simple exercises to practice on the piano and then a 20-minute lesson on a specific piece; afterward, their playing was taped and evaluated by experts. The first group was simply instructed to do the exercises and enjoined to practice them in the traditional way: through repetition and rote learning. The second group was given this instruction:

We would like you to try to learn these fingering exercises without relying on rote memorization. Try to keep learning new things about your piano playing. Try to change your style every few minutes, and not lock into one particular pattern. While you practice, attend to the context, which may include very subtle variations or any feelings, sensations, or thoughts you are having. (Langer 2007, p. 27)

The students in the second group were given one additional reminder about these instructions at the midway point of their practice sessions. When the two groups' playing was evaluated afterward by experts, the results confirmed the power of mindful practice: "The subjects given mindful instruction in the early steps of piano playing were rated as more competent and more creative and also expressed more enjoyment of the activity" (p. 27). If you are capable of opening your student practice sessions with instructions like the ones provided by Langer and her colleagues and of pausing students occasionally throughout the process—whether you do so individually or to the group as a whole—you are capable of helping students learn through mindful practice in your classroom.

MODELS

The models presented here will deviate slightly from the form established in the other chapters because the strategy is such a straightforward and obvious one and has been stated already: you should give students small and regular opportunities in class (or synchronously online) to practice whatever cognitive skills you would like them to develop and that they will need to succeed on your assessments. They should be able to practice these tasks in advance of and separate from formal grading, and they should

receive some feedback on their practice, from you or from peers. Instead of repeating this advice in different forms, I instead outline the three steps that are essential to creating this type of practice session.

Unpack Your Assessments

Your first task is to analyze your assessments and to break them down into the various cognitive tasks that they will require of your students and to understand for yourself the priorities that you assign to those tasks when you grade the assessments. Only after you have unpacked the assessments in this way can you determine what will be most beneficial for your students to practice in class. Once you have done this, you might find it surprising to note—as I once did—how many of the skills that you require of students on your assessments are ones you don’t normally allow them to practice in your course.

For example, writing a paper of literary analysis, which most of us who teach literature ask of our students, obviously requires students to analyze and make an argument about a work of literature. That’s the skill that we typically focus on in class: we model the process of analyzing literature for them, and we ask them to venture their own analyses in our class discussions or group exercises. But consider just a small number of some of the *other* cognitive skills that are necessary to write an effective paper of literary analysis and that would come into play in my evaluation of such a paper:

- Writing an introductory paragraph
- Crafting a one- or two-sentence argumentative thesis
- Incorporating quotations into an essay
- Building body paragraphs around evidence
- Writing according to correct grammatical conventions
- Writing a concluding paragraph

Looking over this (partial) list of skills my students would need to complete this complex assignment, I would probably pinpoint the second, third, and fourth ones as accounting for the highest proportion of the grade I will assign to their essays. In a typical class session in a literature course, I might give them some form of practice for the second skill by asking them to argue or state their positions about the work we are discussing—although even this I would typically do orally instead of in writing. However, until I encountered Langer’s work and thought about the importance of mindful practice in the classroom, I almost never gave my students time in class to develop the skill of building a paragraph around a piece of evidence or of incorporating a quotation effectively into a piece of writing. Post-Langer, I now have students complete writing exercises in which they practice these skills several times in a semester.

Consider the more generic example of asking students to give a slide-based presentation: putting aside whatever cognitive tasks might be required by the specific dictates of your presentation assignment or the work of your discipline, such an assignment entails the following cognitive activities:

- Organizing material into slide-sized chunks
- Creating slides with an appropriate amount of text
- Finding, selecting, and incorporating images, video, or audio onto slides
- Balancing their spoken words with the text on the slides
- Allowing enough time for audience members to absorb the material on each slide

If you have sat through presentations at your disciplinary conferences, as I am sure most of us have, you will no doubt recognize that these are complex skills that many teachers have not yet mastered, much less students. How many times have you seen, for

example, slides that are totally jam-packed with text that is then read out verbatim by the presenter? Or how many times have you seen slides that are totally jam-packed with text that are projected for less time than it would take for the audience member to read them? Did you know that research has been conducted on this very issue of whether or not we should read the text on our slides (Miller 2014, p. 154)? And if you don't specifically give students practice at creating and speaking from slides—based either on that research or on your own experience as a deliverer of presentations or as someone who has witnessed many of them—how are you expecting your students to do it effectively? And how fair is it to grade them on it?

I know that a common (if unspoken) objection to this line of thinking might be that the students should have learned and have practiced these skills somewhere else: in their composition courses, or in a speech class, or in high school, or in someone else's class. Maybe. But unless your students are walking into your class and nailing their presentations from day one, they obviously still need practice at it. If you are not going to give them that practice, whom do you expect to do it?

First step: break down your major assessments as finely as you can, and identify the cognitive skills that students would need to succeed on that assessment.

Parcel Them Out and Practice Them

Second step: create small teaching opportunities for your students to practice those cognitive skills in class or online.

Practice strikes me as an especially appropriate activity to assign to the closing 10–15 minutes of class, as your practice

session can help the students work on skills that stem from that day's class material. If we are having an open-ended discussion about a poem in my literature course, in which both I and the students have articulated various thesis-type ideas about what we think the poem means, I could close that discussion 10 minutes before the end of class and ask students to write two sample thesis statements in their notebooks about the poem based on the arguments they heard that day. Even better, I could close the class 15 minutes early, spend 5 minutes reviewing with them the components that make for an effective argumentative thesis, and *then* ask them to take 10 minutes and write two sample thesis statements. At the beginning of the next class session, before we moved onto new material, I might ask them to select one of the two thesis statements they crafted, find a quote from the poem that would support it, and then write a single body paragraph centered on that quote. (Again, ideally, I would perhaps spend just a couple of minutes beforehand reminding them about the essential components of a good body paragraph.) Giving students a dozen such in-class tasks over the course of the semester would provide them with substantial practice at skills they need for many types of college essay assignments.

For a presentation assignment, you might pick a day two weeks in advance of the actual presentations and ask students to bring their laptops to class. In the final 10 minutes of a class in which you present some new material to them, ask them to pair up and work together on the creation of a single slide designed to teach an audience about Concept A. In the following class sessions, allot the final 10 minutes of each class to asking a handful of students to stand up and give a 2-minute presentation of the slide they created. Better yet, as in the writing example, make it the final 15 minutes and spend the first 5 minutes reminding them that

reading text directly from slides can produce something called the *redundancy effect*, which can reduce learning, but that too much difference between what's on the slide and what they say also has been shown to reduce learning. So they should be searching for what Michelle Miller describes as the “‘Goldilocks’ principle with respect to the discrepancy between the narration and the visually presented slide”—they should clearly reference and highlight the key components of what they have put on the slide, but not simply read it out directly (Miller 2014, p. 154). Giving students the opportunity to create several practice slides, and then to work on speaking those slides to an audience, would go a long way toward improving the majority of student presentations I have seen.

Provide Feedback

Third step: provide feedback on their practice efforts.

The ideal practice–feedback situation is something like what I encountered with my more experienced skiing friend—while I practiced, he observed and offered timely suggestions on how to improve. This kind of feedback can occur in individual tutoring sessions, in coaching many kinds of sports, and in arts instruction—think of a student practicing the piano under the watchful eye of her instructor. Although we obviously can't create this kind of one-on-one feedback loop in our typical college courses, we still should search for ways to provide students with feedback on their practice. The simplest means of doing so, in a face-to-face classroom, is to combine individual and group feedback during and after the practice session. While students are engaged in their practice work, circulate among them and offer individual feedback on the work of as many students as you can.

You will probably find that patterns of problems begin to emerge as you observe the work of more and more students. After you have offered some individual feedback, then, you can pause the session and offer feedback on those common issues to the entire group. This process can be repeated as often as necessary. At the start of such a practice session, you will have to make clear that you intend to provide feedback in this manner. If you don't, you might find that some students feel uncomfortable at receiving feedback in this way, thinking that you are singling them out for some reason. Just announce at the start of your first session that you will be circulating and offering feedback to as many students as you can and using what you observe to help the entire group.

Obviously, you can do the same thing in online environments, offering individualized or spot feedback on practice work and then using what you observed to offer more general remarks to the whole class. If you do use this method to offer feedback, either face-to-face or online, it's worth a few minutes of reflection on how you can spread the individualized feedback around the entire room so that as many people as possible receive individualized attention over the course of the whole semester. You can use the shape of the room, the rows or columns of desks, or even the course roster to help ensure you are circulating among the students in an equitable way.

Finally, although much of the feedback you give to students might offer simple tweaks or tips on how to accomplish a particular task more effectively, you can certainly shape that feedback so that it pushes students toward the kind of mindful learning Langer advocates. In the provocative closing chapters of *The Power of Mindful Learning*, she makes the case that the kind of open-ended, flexible thinking fostered by mindful learning constitutes the very heart of what we think about as intelligence:

Although flexible thinking is the essence of mindfulness, flexibility can also be considered a quality of intelligent thinking. We all have a repertoire of lower-level procedures and higher-level strategies that may be tried in novel settings. The larger our repertoire and the less we are attached to any specific procedure or strategy, the more flexible our thinking is likely to be. . . Our general capacity to sort through these various strategies and procedures and assess which can be applied most appropriately to a novel task is the process usually called intelligent thinking. (p. 113)

In other words, intelligence in the completion of cognitive tasks consists of the ability to step back from our familiar patterns, consider whether alternatives exist, and then recognize whether any of those alternatives might work more effectively. So if we want students to think in these intelligent and creative ways about the cognitive tasks required by our assessments, we should encourage them to do so in our practice sessions. Feedback might occasionally nudge them to step back from the specific task and consider alternatives. Why have you chosen to use that strategy for your introduction? What alternatives might you have chosen? Is that the only formula that you could have used to solve this problem? Have you ever encountered a question like this outside of this course? How did you answer it then? If I posed this question to someone who had not taken this course, how do you think they would go about trying to answer it? Questions like these, designed to push thinkers up to a more aerial view of their practice, may help create the kind of mindful learners that don't lock into familiar patterns and rely on rote repetition to complete their cognitive tasks.

PRINCIPLES

As Ellen Langer's theory of mindful learning reminds us, not all practice is alike. But any opportunity you give your students to practice cognitive activities in your classroom will likely yield them benefits when they are faced with completing your assessments. Keep in mind the following principles as you reflect on how to incorporate effective practice sessions into your course.

Make Time for In-Class Practice. While you certainly can and should give students practice opportunities through homework, make time for it in your classroom or (for online courses) synchronous sessions. Practice that takes place away from the presence of an instructor can become a breeding ground for overlearning, mindless repetition, and the development of wrong or poor habits. Practice that takes place with the benefit of your presence and feedback has potential to create more powerful learning. Keeping the sessions small will help you find space for them in your valuable classroom time.

Space It Out. According to the research we reviewed on spacing and interleaving, five 10-minute practice sessions spaced out throughout a course will work more effectively than a single 50-minute practice session. This makes practicing according to the small teaching paradigm ideal for learning: the multiple, brief sessions a small teaching approach would recommend are exactly what should benefit your students most fully.

Practice Mindfully. Repetition helps us master cognitive tasks in the same way that it helps us master learning to cook a favorite dish, skiing on shaped skis, or speaking confidently in front of an audience. Although repetition on its own will produce a certain base level of competency, it won't help us grow and improve unless we pause at least occasionally to reflect on what we are doing, why

we are doing it, and whether alternative pathways might exist. Use practice sessions to nudge students toward mindful learning.

SMALL TEACHING QUICK TIPS: PRACTICE

Much of the work of this small teaching technique happens outside of the classroom, as you analyze the assessments you give and break them down into their component skill parts. Once you have done that, make a little space in class for each of them and guide your students toward mindful learning.

- Before the semester begins, brainstorm a comprehensive list of cognitive skills your students will need to develop to succeed in your course.
- Prioritize them; decide which ones students will need to develop most immediately and which ones can emerge only after they have mastered some basic skills.
- Review your course schedule and decide where you can make space for small practice sessions in key skills prior to your major assessments; mark those sessions on the syllabus schedule.
- Stick to your plan. Prior to any major assessment, ensure that students have had multiple opportunities to practice the skills they will need to do well, from creating slides or writing paragraphs to answering multiple-choice questions.

CONCLUSION

As you can probably tell from the examples I gave throughout this chapter, incorporating brief practice sessions into the classroom has been one of the most important changes I have made to my teaching in recent years. After the success I had in helping

students give more effective presentations, I began moving more and more skill-based activities into the classroom, including everything from writing introductory paragraphs to writing sample essay exam questions. All of that practice, along with the positive effects that appeared in the work of my students, convinced me completely of its potential to improve student learning and performance.

I can't close this chapter without noting one hurdle that I had to overcome as I gradually shifted more and more practice sessions into my classroom: the uneasy feeling I would get when students were working away at some task and I wasn't actively engaged in what I had always thought about as teaching. I wasn't lecturing them, leading a discussion, trying to keep a handle on a group project, or supervising an assessment. These are comfortable and familiar activities for teachers; observing, listening, and reflecting seem less familiar to us in the classroom. However, if you can learn to use the time in which they are practicing as an opportunity for you to gain a better understanding of their current skill levels and can offer them both individualized and group feedback, you will grow more accustomed to those moments in which you are not teaching in more familiar ways, just as your students will grow more accustomed to thinking about the classroom space not as a place to sit passively and absorb material, but as a site in which to engage in active, mindful practice of important intellectual skills.

Hi, 共建者

flomo 浮墨笔记

常见问题

快速上手

flomo 方法

用自己的话，写卡片

用标签，让结构生长

用回顾，持续刺激记忆

快速记录

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语音输入 ^{Pro}

禅定模式 ^{Pro}

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热力图与统计

快捷搜索

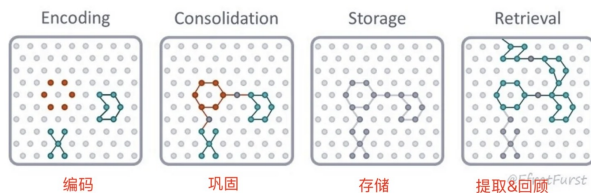
3 用回顾，持续刺激记忆

为何需要回顾过往记录

消费时代，我们对知识也很容易「喜新厌旧」。总认为学习新知，比回顾旧识更有价值。因为会认为知识就像消费品那样，新的总是好的。

但美国天文学家卡尔·萨根说：最重要的知识，并非是刚在过去一小时内被发现的知识。新知识未必就是重要的知识，深入的研究远比肤浅的了解更有价值。

通过回顾不断刺激我们的大脑，这样就能在找到过去存储的记录之外，还会增加许多相关的新信息。而随着我们通过主动及被动两种方式，对过往记录调用的频次变多，我们最终连通的知识网络面积就越大。



图片 by Dr. Efrat Furst

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你会怎么做？