

WEEK 7

Students as Learners

Picture a well-meaning parent who decides to become a football coach for his son's team. This father played football himself, has watched football on television for many years, and has even carefully observed how other coaches have worked with his child for a year or two. So he feels he has learned enough from his own experience and observations to handle the job of conditioning and coaching these young bodies to play a physical sport that he knows well.

On the first day of practice, the kids arrive, and he asks them to spend a few minutes warming up. He instructs them to stretch as he is used to stretching, and as he is accustomed to seeing athletes or actors on television stretching: bending some part of your body in this or that direction, and bouncing back and forth until the muscle is loosened up. After five minutes of this stretching over various leg and arm muscles, he has them up and running—all of them now working twice as hard, however, against the muscles that his “stretching” exercise has helped to contract.

Many of us engage in what my physical therapist friend Patty calls this “bounce stretch,” a common-sense version of stretching that actually has the complete opposite effect on the muscle. When physical therapists or physicians need to make a muscle

On Course: A week by week Guide to Your 1st Semester
Lang, James M. of College Teaching
Harvard University Press, Cambridge, MA (2008)
pp. 153-177

contract, they will use tapping and bouncing motions to induce it to do so. Actually stretching a muscle involves bending the body into the correct position and holding it there for at least ten seconds, the minimum amount of time it takes for the muscle to begin to loosen. Even people who have a vague understanding of this rarely hold the position for the required ten full seconds, according to Patty.

Our football coach, though, is in a teaching position, and is attempting to help his charges learn to use their bodies more effectively. Unfortunately, he is doing so without knowing very much about how the human body works—relying only on his own experience, his observations of what other people do, and his common sense. All of that is leading him not only to ineffective conditioning, but to actions that actually may cause harm to his kids. If he had even the most basic knowledge of the human body, it would make a huge difference in his ability to help prepare them for practices and games.

Can you see yet where I'm going with this?

Most college and university faculty believe that they can help other human beings learn complex subject matter simply by relying upon their own experience as learners, casual observations of their fellow teachers, common sense, and their own big brains. But we all know perfectly well the dangers of generalizing too broadly from our own experiences, and we all know from our own disciplines how misleading common sense can be when it comes to complex subject matter. Observing our fellow teachers won't help us much either, if they're all in the same boat as we are.

You may think of yourself primarily as a scholar, but if you are reading this book you are also a teacher (or about to become one), which means that you are in the business of helping other human beings learn. Learning is a complex process that

evolves as we age, and there is a huge body of research literature on the neurological and psychological processes that allow human beings to acquire new knowledge and skills. You may have just finished writing the document which chronicled your travels through mountains of research literature in your discipline, and which earned you your doctorate, so the thought of wading through another mountain of such literature probably does not sound too appealing.

My goal here is not to send you back for a second doctorate in learning theory (would there be anything more cool, though, than having two doctorates?), but to convince you that your responsibilities as a teacher obligate you to acquaint yourself with one or two of the major explanations for how adult human beings learn, and to think about how those explanations might affect what you do in the classroom. Doing this can be a much less painful process than you might imagine—the half-dozen books on teaching that I will recommend in the final chapter will give you a solid foundation in the basics of those theories, along with plenty of practical advice on what to do in the classroom. Even brief articles that you might find in specialized journals on teaching, such as the *Journal of College Science Teaching* or the *Journal of Teaching Sociology*, will usually begin with an overview of whatever learning theory or teaching philosophy animated their experiment or classroom technique.

I'm going to get you started on this process by providing an introduction to two basic theories of how students learn and develop intellectually during their college years. I have reserved this information for the seventh week of our semester together because, while of course this knowledge should be helpful to you from the start, I know from experience that the overwhelming nature of teaching for the first time can push all but the most practical considerations out of your head for the first month or

two in the classroom. You'll be thinking about little beyond how to survive the next few days, or how to turn around the next set of papers or exams, or how to deal with some baffling and unexpected situation with a troublesome student. So my recommendation would be to read this chapter through now as you are reading the entire book, but then to go back to it at mid-semester—you might have a few days' break in the fall around now, or a full week's break in the spring—and read it again, seeing whether the experiences you have had with students thus far match the ideas about how human beings learn that I am about to describe to you.

These two different theories don't cover the same territory—one offers a basic model for how human beings process new information and knowledge, beginning in childhood, while the other is a more specific theory about a series of intellectual stages that students go through during their four years in college, stages that affect profoundly how they hear and respond to what happens in our classrooms. You will find plenty of books and essays that elaborate on these two theories, as well as plenty of arguments against them, or in support of alternative theories, or in support of modifying or updating those theories. This is not the time to become overwhelmed by these debates. Dip a toe in by starting here, and then wade in a little deeper, with a new book or a few articles on teaching and learning, over every summer break.

Mental Models

I introduced the idea of mental models—or “schemas,” as they are sometimes called—in Chapter 1, so I'll elaborate on that conception a bit more here. This particular learning theory is difficult to attribute to any one thinker or text, although the educational theorist Jean Piaget would have as strong a claim on its

origins as anyone. Piaget analyzed how children acquire knowledge, and posited a process in which children use their interactions with the world to construct models of objects and patterns of action. Those models of reality are subject to frequent revision by the child as she comes in contact with new objects and experiences; over time, the child slowly builds her mental models into increasingly more complex patterns and ideas. The important part of this process for our purposes is the fact that this learning process means the child is constantly revising—and transferring to other areas, and abstracting into general patterns—her already existing ideas or mental models. So what the child already knows plays a crucial role in how she encounters new experiences and objects, as the child works to fit new elements into the patterns she already understands. Piaget identified two primary parts of the learning process: *assimilation*, in which the child takes new information and slots it into her pre-existing mental frameworks; and *accommodation*, in which the child encounters new information that requires her to make changes to her current mental models. (All of this is a gross oversimplification—but Piaget's prose can be tough sledding, so be grateful for what you're getting; see Singer and Revenson, 12–26, for a basic and very readable overview.)

I'll give you a concrete example from my own experience in raising five small children, two of whom just passed their second birthday. We have a piano in our house, which I play and which the twins like to bang on whenever possible. Their act of banging on the piano keys to produce noise has helped form for them a mental model of a piano, and the pattern according to which it can produce sound. When the twins go to my neighbor's house next door (blessed relief!), their understanding of the mental model of the piano enables them to walk right up to my neighbor's small spinet and produce similar noises on it, despite its very dif-

ferent appearance from our upright piano. Their mental model serves them well in that respect, helping them negotiate what otherwise might be an unfamiliar object; they are able to *assimilate* the new object into their model of a piano. However, recently I bought an electronic piano (if all goes according to plan, you will know me better as a rock star than an academic by the time you are reading this), which requires either headphones or an amplifier to make noise—neither of which I had for a while. When I brought the new instrument into the house and set it up, the twins immediately went over to it and began banging on the keys—much puzzled, for the next few minutes, by its silence in the face of their actions. The electronic piano will require an *accommodation* of their mental model of these black-and-white-keyed objects—some of them respond to banging with noise, and some don't. It may take several years for them to clarify the situation and put those objects into two separate categories: pianos, and electric pianos or keyboards. Shortly after they gave up trying to play the piano, I found the boy twin climbing on the instrument, perhaps searching for a new mental model—jungle gym?—for what must initially have seemed to him like such a familiar object.

The process of forming and maintaining mental models becomes more complex as we age, but the basic idea still applies to the students who come into our college classrooms with mental models of our subject matter. I mentioned earlier the mental models of Native American culture that students might bring into an anthropology course. A great deal of research has been done, in particular, on the mental models of motion that students bring into physics courses. Craig Nelson, a scientist who writes and speaks extensively about how we teach critical thinking in the sciences, describes one such study and its results in this way:

Suppose I toss a ball into the air, catch it, and then ask students what forces act on the ball on the way up. Only about 10 percent of the students in an introductory college physics course have entered the seventeenth century. These few Newtonians will answer that the only significant force is gravity, which acts to slow the ball's rise. The other students will give answers that reflect alternative, non-Newtonian views of reality. Much of the students' direct prior experience has been that, when one stops pushing something—for example, a desk across a carpet—it stops moving. Typical physics courses produce no significant change in the percentage of students who eschew such Aristotelian notions. (46)

In other words, students take their experiences in moving things and watching them move to form common-sense theories of motion, and the forces that create and impede motion. Such theories are not stupid—many of them match the theories that Aristotle developed, and Aristotle was hardly a moron. But they don't take into account basic developments in science over the past four hundred years, and—what is most disturbing, as Nelson points out at the end of the passage—introductory physics courses often produce no change in the common-sense theories of motion that students bring to those courses.

All of this means that students are capable of encountering new information about motion, and theories of motion, and cramming that new information into their common-sense, Aristotelian mental models—assimilating rather than accommodating. So they may be able to “learn” physics, and perform well on exams, without making the fundamental changes to their mental models of motion—that is, moving from post-Aristotle to post-

Newton—that any physics teacher would want to see her students make. Our mental models can have such a powerful hold on us that we will perform all kinds of intellectual gymnastics in order to avoid abandoning them for new ones. My twins, for example, understand what it means for something to be broken, so they could maintain their simple mental model of a piano by concluding that my electronic piano is simply a *broken* piano rather than a different kind of piano, or something altogether different from a piano (they are a bit young to articulate to me exactly what they think, so I'm hypothesizing here). For them to make this intellectual move, joining the idea of *piano* with the idea of *broken*, costs them a lot less mental energy than it does for them to build up an entirely new mental model of a completely different kind of piano, or something altogether different that happens to resemble a piano. Such idea-building has an emotional cost as well—every time a child or student encounters an object or pattern that does not fit into one of his existing models, he has entered a temporarily unfamiliar space, a world which does not work as expected, and coming to grips with that and determining how to proceed can be a frightening and exhausting experience, depending upon the nature of the question. It probably didn't cost much emotional energy for the twins to revise their model of a piano, but it might take tremendous energy for a student with strong religious beliefs to encounter scientific theories that call into question her basic assumptions about the creation of the world—and she might fight tooth and nail to assimilate as much of that scientific information into her religious mental models as she can, and ignore the rest.

Another perspective on all of this, one developed by Jack Mezirow, comes from a theory that uses slightly different language to make a similar distinction between *transformative* learning and *assimilative* learning. Assimilative learning, as with Piaget,

means that students simply absorb knowledge and fit it into their current knowledge structures, or mental models; transformative learning entails students tearing down their current structures or models and rebuilding them with the new knowledge we are offering to them. Kelly McGonigal describes the limitations of assimilative learning with the familiar example of students learning (or not learning) in physics: "In the sciences and mathematics, it is common for students to have learned an oversimplified definition or approach in high school. Students making the shift from classical to modern physics, for example, cannot simply layer new information onto old understanding" (1). Layering new information onto old understanding is assimilative learning, of the kind that Craig Nelson described. By contrast, transformative learning, as Mezirow puts it, is a complex process that includes

becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings. (167)

The language is slightly different, but the ideas are the same. Transformative learning means becoming aware of our mental models or schemas ("assumptions" in the quote above), recognizing their limitations, and revising them to accommodate the new knowledge we are receiving.

Two points deserve special emphasis here. First, students bring mental models to every course, and those models influence what they see and hear from us. As I argued in Chapter 1, you should

attempt to devise methods to discern the mental models that students will typically bring to your courses. You can do that with exercises or worksheets in the first week of the semester, but you can also get a good deal of information by looking at articles on teaching in your area; you can find these in journals devoted to teaching in specific disciplines, or in articles or sections in the flagship journals of your discipline. A major journal in political science, for example—*PS: Political Science and Politics*—has a section in each issue devoted to articles and debates on teaching political science. However you get the information on students' mental models of your subject matter, your awareness of those models will allow you to address them and work more effectively to revise them or help the students dismantle them and build new ones.

Second, remember that abandoning old models of reality, or building new ones, is difficult work that may challenge assumptions and beliefs that students have carried with them for long periods of time. It's perfectly sensible for human beings to want to integrate unfamiliar ideas or objects into their existing models, and perfectly understandable why they might resist doing otherwise. Sometimes you will encounter students, either in class or in your office, whose ignorance can seem downright willful, or who give back to you such a distorted picture of what you have presented that you might be tempted to conclude that they are complete ignoramuses. My colleague Lucia Knoles told me that some of her students in an American literature class who read accounts of slavery in the United States before the Civil War were amazed to learn that some slaves worked as servants in houses rather than being out in the fields picking cotton and getting horsewhipped, and therefore they concluded that slaves had it much easier than they ever realized. Lucia was aghast, but realized that these were students who had never had large-scale

evil or injustice thrust in their faces, and had therefore been carrying around with them the basic belief that the world was a just place, and that people were mostly good. Instead of letting the history of slavery challenge or complicate that belief, they immediately pounced on a tiny piece of the history of slavery and used it to slot the entire phenomenon into their unchanged world-view.

So keep this in mind when you encounter students who either seem resistant to what you have to teach them, or who just don't seem to get it. Be compassionate in the first case—what might seem like willfulness or defiance might be fear and anxiety at the prospect of having to tear down a familiar or deeply rooted mental model. In the second case, instead of just hammering away at them with the same facts and ideas, stop and take stock—are there mental models that are preventing the student from properly processing what you have to offer? If so, can you find a way to address those models, and point out to the student why they need revision?

The theory of mental models can help you in the classroom, though it may take some time for you to determine exactly how to discover and address the models that students bring to your class. The same is true of the second theory I want to tell you about, one that focuses specifically on learning and the intellectual development of students in their college years, as opposed to the more general theory of how human beings learn.

William Perry's Theory of Intellectual Development in College

You'll have to read around in a few different sources to get a fuller picture of the mental models theory (start with the *Piaget Primer*, and then try Driscoll's overview), but the second theory I

want to introduce to you comes handily packaged in a single book. And if you like to read about research conducted in the old-fashioned way—that is, by chain-smoking professors working for offices with vaguely KGB-like names—then you will enjoy your trip through William Perry's *Forms of Intellectual and Ethical Development in the College Years: A Scheme*, first published in 1968, and still influencing the way many of us understand our students today.

Perry worked for the Bureau of Study Counsel at Harvard University in the 1950s, an office which advised students who were having difficulties with their academic work. In 1953, Perry explains, the office staff set out to “document the experiences of undergraduates in Harvard and Radcliffe over their four years of college” (3). They worked with a number of different means of obtaining this documentation, over the course of the next half-dozen years, until they finally hit upon the method that Perry describes in his study: administering questionnaires to the students about their attitudes toward teaching, learning, and knowledge at the beginning and end of each of their four years of college, and then conducting long and extremely open-ended interviews with the students about their responses to the questionnaires. Items on the questionnaire asked students to express different levels of agreement or disagreement with statements like this one: “One thing is certain: even if there is an absolute truth, man will never know about it and therefore must learn to choose and venture in uncertainty” (69). The oral interviews began with this question: “So what would you say stands out for you most about the year, as you look back?” (69), and from there the interviewer simply followed the direction of the student's remarks. Perry and his colleagues ended up with 464 interviews, which covered 84 students over the four-year sequence, and from all of this data he developed his scheme.

You'll be able to find quick and easy summaries of Perry's research on the Internet, and updated versions of his scheme in many places (the same is true with Piaget's work), but the original book remains worth reading, not least for the glimpse you get into the protocols, and lack thereof, of interviewing and producing scholarly research on human subjects in the 1950s. In one amusing interview transcript, the interviewer interrupts his subject with the question “Join?” and the italicized narrative explains that he has offered him a cigarette. You can almost picture him there in some white room in a basement of the Harvard campus, with a tape recorder the size of a minibus, wearing a gray suit, black-framed glasses, and a crewcut, holding out his packet of cigarettes to a fidgeting undergraduate. The language of the study is hopelessly gender-specific, with lots of talk about “mankind” and “man” believing this or doing that. And despite multiple protestations to the contrary, it seems clear to me that the idea for the scheme developed early on in Perry's mind, and many of his questions and interviews pushed subsequent students to help him confirm it.

Despite all of this, Perry's work remains influential for many college faculty, no doubt because the three main stages of intellectual and ethical development that he claims college students experience during their four years on campus will strike anyone with teaching experience as immediately insightful. The stages or forms that Perry describes are distinct from any specific content or discipline; he defines them as “the formal properties of the assumptions and expectancies a person holds at a given time in regard to the nature and origins of knowledge and value” (42), examples of which include terms like “dualistic” and “relativistic.” The overall scheme posits three major stages of intellectual development that students work through in college, with three subpositions in each stage. However, the students do not march

through these stages with arms linked, chanting the college fight song. Some students never leave the first stage, or they may reach a later stage but then remain stuck there; and students may show evidence of being in different stages when they are in different kinds of courses (for example, in their major courses they may exhibit sophisticated, stage-three thinking, but in a general course in another discipline they may still be in stage one). Perry clearly believes that movement through the stages represents intellectual and ethical progress, although you do not need to share that view to recognize that his scheme pinpoints a set of attitudes and perceptions about knowledge that you will see displayed in your classrooms and office hours.

The first stage Perry identifies is that of dualism, which moves from simple to complex forms over the three subpositions of that stage. Students in the dualistic mode of thought believe in absolute truth, which exists somewhere out in the world, and which their professors have somehow gained access to. The job of the professor is to take that absolute knowledge and pass it along to the students; the job of the student is to obey authority and absorb the truth. Students at this stage will naturally prefer lectures, and will probably chafe against too much discussion or small group work in the classroom. "I'm paying to learn from the expert," you might hear a student like this say, "so why do I have to sit here and listen to what a bunch of my classmates have to say?" They also will expect teachers to present theories and facts in a straightforward, uncomplicated way, and will be unsettled when this does not happen. Perry quotes from an interviewed student who expresses unease at the difference between history as taught in high school and history as taught at Harvard:

Well, in high school we took a course like that, a history course. In that course the teacher would be telling you ex-

act facts and here it's altogether different. I don't know. I like the work better when they . . . I suppose it's more immature, but I like it better when they give you something concrete, exactly what happened—not go off on a tangent on some phase that appears on the surface not to have anything to do with the subject. I don't particularly care for that. (76)

The student's desire for the "exact facts," and for something "concrete," demonstrates his commitment to dualistic thinking, which would involve a mode of teaching that relates the "true" historical narrative without bringing in alternative histories or alternative versions of the facts that are presented. He is searching, in other words, for a kind of history that you simply won't find on college campuses today, where the very notion of a historical fact has been called into question by our awareness of the multiple and competing narratives of the past, each highlighting different facts and different understandings of the common facts.

It would be difficult for a student to last long on a college campus today with this attitude toward the world, and in fact I suspect many students who leave college do so because they can't reconcile dualistic thinking with what they hear and experience in their classrooms—and the world of dualism is a comfortable one, since answers exist for every question, so abandoning it can cause some emotional distress. Perry in fact argues that it is rare to see complete dualism even in entering freshmen, and that most students who enter college have begun to see the limitations of this worldview. One clear path to seeing those limitations comes when students realize either that two experts in a subject may disagree—they might learn this from taking two different courses in the same discipline, with professors who

fundamentally disagree about the nature of the discipline—or that in all disciplines there remain areas of doubt and uncertainty. A student confronted by these issues moves into the transitional positions of stage one, believing perhaps that while absolute knowledge must exist somewhere, we just haven't found all of the answers yet.

Most students, however, according to Perry, move from these transitional positions of dualism into the three possible positions of stage two, or relativism. The first move into relativism is a liberating one in which the students feel that, since no one has the correct answers, then all answers are equal—including their own. "That's the great thing about a book like *Moby Dick*," Perry cites one student as saying. "Nobody understands it!" (98). That nobody understands it, on the positive side, might free the student into venturing her own opinion about the book, in a way that she might not have wished to under dualism (since the professor has the right answer anyway, why risk being wrong?). On the negative side, students newly entered into this position will question grades defiantly, wondering what gives their professors the right to take points off their answers, since everyone has a right to his opinion—and students in the early position of this stage will see opinions and answers and arguments as all one and the same. If not defiant, they may be bewildered, unclear why one paper receives an A and another a C. "If I present [a paper] in the right manner it is well received," one student says, trying to reason it out in his mind, but then giving up. "Or it is received . . . I don't know, I still haven't exactly caught onto what, what they want" (90). So relativism will come with feelings of liberation for some, but fear and unease for others, as they find themselves floating in a sea without any landmarks to help chart their course.

For all students, though, this stage will come with an accompa-

nying sense of academics as gamesmanship, in which the student has to figure out what each professor wants, and conform to each faculty member's individual whims, in order to do well in school. The students understand now that answers no longer exist in the sky; they understand as well that grades are determined by human beings, and therefore they have to learn to provide the answers that these different human beings want. Students in the later positions of this stage will develop a procedural mentality in which they spend some initial time each semester figuring out what the professor wants, and then spend the rest of the semester doing their best to give that to her. I've heard some of my smartest students, speaking to me during my office hours, describing very explicitly the importance of learning to write to each professor's particular biases—these are students engaged in procedural knowing. There is, of course, some truth to this recognition on the part of the students, since all teachers will tend to emphasize certain writing skills or habits over others, and we will never achieve universal, objective grading standards. But students at this stage will operate under an exaggerated sense of completely variable standards from one faculty member to the next, and from one course to the next.

A student who has reached this stage, and is capable of discerning and working up the standards of each professor, could graduate with honors and succeed easily in the world—and so, in that sense, could be counted as a successful college student. But we don't want our graduates to be chameleons who are perfectly willing to camouflage themselves against whatever color appears in the background, without making any judgments about it at all. Therefore, most of us who teach want to push our students into one of the positions of Perry's final stage, which entails the students making commitments to the values and knowledge that matter to them in a pluralistic world.

As Perry points out, doing this is an emotionally trying experience, and a cyclical one as well—students might make their initial commitments to a certain set of ethical values, for example, and imagine themselves done with that trying decision, only to stumble immediately into all of the complications and extenuating circumstances that make ethical decisions so challenging. One of Perry's students offers this description of making a commitment but then realizing that nothing is final: "It's a real, definite commitment, with a possibility of (*laughs*) of withdrawing from the commitment, which I think is the only realistic kind of commitment I can make, because there is a possibility of change here" (161). I think this is exactly the kind of student we should strive to produce in a pluralistic, democratic society—a person who understands the importance of making a commitment to a specific set of values and knowledge, but who recognizes the contingent nature of that commitment and keeps an open mind about the possibility that his values might one day change. Such a student would also recognize the contingent nature of the values of his peers, and hopefully would respect those values even while he maintains his own commitments.

I should note here that producing such students does not in any way require them—or you—to give up religious faith. Perry addresses this issue frequently in the book, and compares stage-one dualism to blind belief, while stage-three commitment resembles a mature and informed religious faith. Whatever our students' religious convictions may be, we are preparing them to live in a pluralistic society which leaves most decisions about values up to individual citizens, and requires that we respect the decisions that our fellow citizens make.

So what does all of this mean for you as a teacher? First, an awareness of these three stages can help you understand how students are hearing and seeing what happens in your class-

room. As you encounter students in these different stages, you'll begin to recognize characteristic comments and behaviors. You'll have dualistic students who come to your office and plead with you to give them the definitive reading of a poem or solution to a problem, or who come crying to you over their most recent paper, not because they want to complain about the grade but because they believe that everyone else knows the answers but they don't. You'll have relativistic students who will point out to you that Professor X taught them differently, and they would just like to know what *you* prefer, and they'll be happy to give it to you. You'll have students fumbling their way toward commitment in their junior or senior years, arguing with you in class about a basic assumption in your discipline, or confessing to you during an advising session that they think they are going to enter the Peace Corps.

Second, and more important, the ability to recognize students in these different stages can make you a more compassionate and effective teacher. On top of everything else we are trying to accomplish in the classroom, we ultimately want to push students as far along the path toward commitment as possible. Dualistic students can be frustrating ones, and we can sometimes mistake their tight grip on dualism for stupidity (just as we might see stupidity in a student who holds tightly to a failing mental model). Understanding the perspective of these students can help us understand how to interact with them more effectively in the office, or even in the classroom, gently nudging them toward the realization that knowledge does not exist out in the sky, but in the minds of other human beings like themselves. I make it a point to begin each course I teach in Introduction to Literature with the argument that no single, correct interpretation exists of a poem or a story, a speech which is aimed at the dualists. But I continue the speech for the relativists—although no single, cor-

rect interpretation exists, not all interpretations are equal. I want students to come up with their own interpretation, based on the reasoning tools I will give them in class, and to defend their interpretations in class and in their papers.

Do freshmen in my Introduction to Literature class immediately jump from dualism or relativism to commitment after hearing this stirring speech? Of course not. But one or two might come around to this way of thinking by the end of the semester, and the rest have heard it, and might remember it when they hear it again in another class, or begin to sort it out in late-night debates in their dorm. Pushing students toward commitment presents even more of a challenge, and at least one study of Perry's scheme, or a modified version of it, suggests that the majority of students don't begin to make serious commitments until their first year or two after college. That doesn't mean that teachers shouldn't still push students in that direction, but it does mean that we should be realistic about what we can expect to accomplish in our classrooms.

I owe it to you as a reader to conclude my summary of Perry by noting that his theories have been extensively debated over the years since their first appearance, and that educational theorists today would be far more likely to cite more contemporary works and authors than Perry. Throwing around Perry's name at a cocktail party of educational theorists wouldn't be nearly as bad as authoritatively quoting Freud at a psychology convention—more like citing Newton rather than Feynman at the annual physics department picnic. And of course my summary has been a simplified one; students will not move through the stages so neatly, and they can be in different stages in different areas of their thinking, and so on—imagine any possible complication that someone might pose to a simple scheme like Perry's, and someone has probably proposed it. Still, the idea of seeing students in these

specific phases, and seeing them move gradually from dualism toward commitments, has always rung true to me in terms of my experiences with them, and this continues to be true for many faculty members today.

You will, of course, come into your first semester of college teaching with a mental model of how students learn, one derived primarily from your own experiences as a learner. That model may be hard for you to abandon, since you have spent much of your life learning, and you have obviously been largely successful in doing so. One goal of this chapter has been to encourage you to take a second look at that model—to consider whether theories about learning and intellectual development in the college years might help you develop it further, and reshape it so that you can more effectively help students learn in and out of your classroom.

Think about your model of student learning, and the teaching strategies that work best with that model, as one that should remain subject to frequent revision and improvement for the next thirty or forty years, as you draw upon both your personal experience and your occasional glimpse into the latest research on student learning and teaching to deepen your understanding of the ways in which human beings learn. I'm with Christopher Lucas and John Murry in setting a second, and very modest, goal for the way in which theories about student learning might influence your teaching:

Possibly the best that can be hoped for, first, is that college teachers will develop enhanced sensitivity to the fact that students do appear to differ in how they learn, even if the variability cannot always be fixed with scientific precision. Second, so far as learning modalities and age-related char-

acteristics are concerned, faculty must learn to eschew reliance on any single teaching approach—for example, on ‘chalk and talk’ alone, to the virtual exclusion of a broad range of other possibilities. (86)

Resources

If you approach the literature on learning theory without a degree in psychology, or neurobiology, or education, as I have, you will probably find what I have found—that the theories of how we learn are numerous, usually overlapping, and sometimes conflicting. Each of them seems sensible on its own, at first blush, and each of them draws critics who enumerate its shortcomings. The best approach, in my opinion, is to do for yourself what I have done here—seek out summaries or overviews of the major theories, mostly available on the Internet, and then look more deeply at the ones that seem to make the most sense to you and begin to think about how those theories could influence your teaching. In addition to the theorists I have discussed in this chapter, I have listed below a few alternative learning models by Gardner and Kolb, as well as one text (Belenky et al.) that updates Perry’s work by considering how students’ gender may impact their learning. You could spend a lifetime of reading on this material.

Belenky, Mary, et al. *Women’s Ways of Knowing*. New York: Basic Books, 1986.

These researchers offer an updated and/or alternative theory to Perry; they focus, as the title implies, on how women might have a distinct learning style. Their theory still matches Perry’s in its basic progression, as they see students moving through four beliefs about the nature of knowledge: seeing it first as received, then as subjective, then moving into procedural and fi-

nally constructed perspectives. If Perry’s work appeals to you, this book deserves a look as well.

Driscoll, Marcy. *Psychology of Learning for Instruction*, 3rd ed. Boston: Allyn and Bacon, 2004.

Designed as a student textbook, this book nonetheless presents a very comprehensive overview of learning theories and their implications for teaching. Have your library order it for you, since its price will be tough on a new faculty member’s budget.

Gardner, Howard. *Multiple Intelligences: The Theory in Practice*. New York: Basic Books, 1993.

You’ve probably heard of this theory in some form or another, although most of Gardner’s research has been done on K–12 students. Gardner argues for the existence of seven types of intelligence—linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal—and says that conventional schooling tends to reward only one or two of those intelligence types. Proponents of his theory work to help students express their intelligences in other forms—through music, hands-on learning, and so on.

Kolb, David. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, N.J.: Prentice-Hall, 1984.

Kolb’s theory of learning posits a four-stage process: concrete experience, observation and reflection, formation of abstract concepts, and experimentation in new situations. This isn’t all that far removed from the mental models theory. Advocates of Kolb’s ideas suggest that students need to begin the learning process with a concrete experience, some kind of activity that will introduce them to an issue and provoke reflection. This is simple enough to envision in a science course but a little more difficult

to imagine in a literature course, though asking students to write a poem might do the trick before they begin the study of poetry.

Lucas, Christopher J., and John W. Murry, Jr. "Active Learning and Other Instructional Management Issues." In *New Faculty: A Practical Guide for Academic Beginners*, 71–104. New York: Palgrave, 2002.

You could start here, especially pp. 81–86, for a good overview of different learning theories and their implications for teaching.

McGonigal, Kelly. "Teaching for Transformation: From Learning Theory to Teaching Strategies." *Speaking of Teaching*, 14.2 (Spring 2005): 1–4; <http://ctl.stanford.edu/Newsletter/transformation.pdf> (January 21, 2007).

A good overview of Mezirow's work; it concludes with a section on practical classroom applications. Available online.

Mezirow, Jack. *Transformative Dimensions of Adult Learning*. San Francisco: Jossey-Bass, 1991.

The theory of assimilative versus transformative learning, which in some ways falls in line with the mental models theory developed by Piaget.

Nelson, Craig. "Cultural Thinking and Collaborative Learning." *New Directions for Teaching and Learning*, 59 (Fall 1994): 45–58.

Perry, William. *Forms of Intellectual and Ethical Development in the College Years: A Scheme*. New York: Holt, Rinehart and Winston, 1968.

Perry's original text.

Piaget, Jean, and Barbel Inhelder. *The Psychology of the Child*. New York: Basic Books, 2000.

As good as it gets by Piaget, which, as I said, can be tough reading. Clear style was not his strong suit.

Singer, Dorothy, and Tracey Revenson. *A Piaget Primer: How a Child Thinks*, rev. ed. Madison, Wis.: International Universities Press, 1997.

A very readable overview of Piaget, and introduction to his work. I found this book quite interesting as both a teacher and a parent.