CHAPTER 1

Understanding Your Students and How They Learn

What do you teach? You have likely been asked that question many times. Think about how you answer. Most faculty members list their areas of expertise: psychology, biology, physics, English, business, and so on. That is fine. We all worked very hard to become experts. We would like for you to begin to verbalize a typically unspoken, but critical element of teaching. The next time someone asks you *what* you teach, give them the name of your discipline and add, "But also extremely important is *who* I teach—students."

This is an important addition in thinking. Most of us have learned the intricacies of a discipline and been granted a degree and a faculty appointment, whether full time or part time, because of that work. Teaching at its best has, for too long, been a secondary consideration. We would like to shift that thinking. Still considering the disciplines in which we gained expertise, let's shift our focus to the plethora of factors that must be learned to gain a second area of expertise, teaching. Our hope is not merely that you teach, but that you teach as if what you do is exceedingly important in maximizing student learning, because it is.

When done well, teaching introduces students to ideas, topics, and information they may not have otherwise experienced. Such teaching also holds the promise of unleashing the potential of the human mind and impacting future generations. Faculty members skilled in educational practices hold the ability to help students achieve things they themselves previously thought not possible. As you will see throughout this book, everyone who teaches can get better at teaching. Teaching well is nuanced and impacted by many factors. There will be many opportunities for you to learn concepts and strategies to help you become the educator you desire to be.

THE STUDENTS IN YOUR COURSE

The first challenge all faculty members face is understanding the students in their courses. This is no small

feat, as there is wide variability among students, and student composition changes constantly. Who you teach this semester will be different than who a colleague at another institution is teaching. Similarly, check in regularly on the composition of the students at your institution, as subtle changes can take place from year to year. If you stop checking in on who your students are, you will walk into a classroom one day filled with individuals who are very different than you expected. If you don't have it already, your institution's admissions or student affairs office is a good place to begin collecting the student data you need. The student affairs office can give you distributions and percentages on a wide number of variables, such as age, gender, race, ethnicity, marital and family status, socioeconomic background, employment status, campus residents versus commuters, domestic versus international, geographical mix, and special admissions. This information is very helpful. For example, if your students are older, research suggests that they often prefer to talk about and apply their work and life experience in class, discussion forums, assignments, and group work, so draw on and refer to those experiences frequently. Because they know the world to be complex, adult learners typically expect to learn multiple ways of solving problems and to have discretion in applying the material. Those learners appreciate the opportunity for reflection after trying out a new application or method. In addition, they want the material to have immediate practical utility and relevance (Aslanian, 2001; Vella, 1994; Wlodkowski, 1993). Adult learners are often highly motivated, eager participants, and well prepared for class.

It is also helpful to know your students' level of academic preparation and achievement. Although many colleges and universities no longer use SAT and ACT scores for application packets (Koljatic et al., 2021), you can find the percentage of students ranked at varying percentiles of their high school graduating classes, the percentage of National Merit and National Achievement Finalists (over 5% is high), and the percentage that qualified for Advanced Placement credit (over 33% is high). For several hundred American colleges and universities, almost all of this information is published every summer in the "America's Best Colleges" issue of *U.S. News and World Report*.

Your institution's career center can provide the percentage of students planning on different types of graduate and professional educations, as well as the immediate employment plans of the next graduating class. Often, departments and colleges collect follow-up data on what their students are doing a few years after graduation. Adult learners are usually seeking a promotion or a new career.

If you are new to the institution, your department colleagues are an excellent resource for providing a good snapshot of the students in the department. When learning about students from colleagues, keep in mind that different faculty members often have different perceptions of students. Therefore, it is typically a good idea to ask a few individuals for input. A final source of information, perhaps one of the best, is the students themselves. During the first week of classes, consider administering an anonymous survey regarding the characteristics of interest to you, or carve out a bit of time and have a discussion with students about how they see themselves as learners and what they prefer.

As you collect information about your students in order to become better positioned as a teacher, it is important to keep in mind that researchers, offices, and administrators talk about students in terms of averages (e.g., average GPAs, proportion of first-generation students, most prevalent ethnicities, number of National Merit Finalists). You don't teach averages, proportions, and numbers; you teach individuals. Knowing the composition of your students will help you create better learning opportunities for them. This is the starting point for teaching at its best and the start to creating inclusive classrooms.

In addition to knowing important characteristics of the student population in your course, so that you can better develop the best learning opportunity for them, another important consideration is how the human mind learns. Some ways of receiving and processing new knowledge are easier for

people to attend to, grasp, and remember. Yet in spite of the fact that we are all responsible for encouraging human minds to learn, too few of us know how the human mind works.

HOW PEOPLE LEARN

Although each student is unique, there are well-researched principles about how people learn that apply to a wide variety of learners. That research is described throughout the book. Following is an introductory list of 15 robust findings about learning along with an example or two to illustrate how these principles can be applied in nearly any course.

1. People have an insatiable curiosity and are learning all the time. They absorb and remember untold billions of details about their language, the people around them, objects in their environment, and things they know how to do (Spence, 2001). Individuals find it much easier to learn what they regard as relevant to their lives (Ambrose et al., 2010; Bransford et al., 1999; Persellin & Daniels, 2014; Svinicki, 2004; Winne & Nesbit, 2010; Zakrajsek, 2022; expanded on in Chapter 19). Explain to your students the relevance of your material to their current and future careers, consumer decisions, civic lives, and personal lives as well as real-world problems. Use examples and analogies out of their lives and generational experiences. Also ask them how they can apply the material.
2. People learn by thinking about the meaning of the new knowledge and connecting it to what they already know and believe (Ambrose et al., 2010; Bransford et al., 1999; Tigner, 1999; Zull, 2002; expanded on in Chapters 17 and 20). Ask students to connect new knowledge to what they already know and believe either in class or in a brief writing assignment such as a self-regulated learning exercise (Chapter 19).
3. People learn more when they are motivated to do so by the inspiration and enthusiasm of their instructors or other people in their lives (Herrando & Constantinides, 2021; Hobson, 2002; expanded on in Chapters 7 and 9). Express your enthusiasm and passion for your material, your process of teaching, and your students.
4. People often learn more efficiently when they are actively engaged in an activity (Freeman et al., 2014; Hake, 1998; Jones-Wilson, 2005; Spence, 2001; Svinicki, 2004; Theobald et al., 2020). Group work generally increases engagement (Persellin & Daniels, 2014; expanded on in Chapters 10 and 16). Allow students to work in groups some of the time, especially on the most challenging tasks, but also inform them that learning is ultimately an inside job—that is, it requires them to focus their mind on the material and their progress in comprehending and recalling it (see Chapters 10 and 19).
5. People learn new material best when they actively monitor their learning, reflect on their performance, and make appropriate adjustments. This process is called *metacognition* or *self-regulated learning*. People are responsible for their learning; it is very challenging to *make* someone learn (Ambrose et al., 2010; Hattie, 2009; Nilson, 2013a; Winne & Nesbit, 2010; Zakrajsek, 2022; Zimmerman et al., 2011; expanded on in Chapter 19). Start your course with a pretest, which will also serve as (1) a diagnostic test to tell you what your students do and do not know; (2) the first half of a self-regulated learning activity, to be repeated at the end of the term; and (3) the baseline for measuring your students' learning at the end of the term (see Chapters 19 and 27). Teach your students how to learn your material, and build in self-regulated learning activities and assignments that make them observe, analyze, and assess how well they are learning (see Chapter 19).
6. People learn most easily when their cognitive load is minimized by reducing distractions and helping learners to chunk information

(Feldon, 2010; Sweller, 1988; Winne & Nesbit, 2010; expanded on in Chapter 19). Minimize cognitive load by (1) reducing extraneous load (information that doesn't contribute to students' understanding or problem-solving facility); (2) integrating explanatory text into visual materials; (3) scaffolding new material (e.g., modeling and providing explicit instructions, step-by-step procedures, and partially worked examples (Feldon, 2010; Kirschner et al., 2006; Mayer, 2009; Mayer & Moreno, 2003); and (4) helping students identify patterns and similarities and thereby *chunk* material into categories, concepts, and the like (Gobet et al., 2001). Minimize student distractions in class, the most tempting of which are technological (see Chapter 4).

7. People learn best when they receive the new material multiple times but in different ways, which uses different parts of their brain (Hattie, 2009; Kress et al., 2006; Vekiri, 2002; Winne & Nesbit, 2010; Zakrajsek, 2022; Zull, 2002; expanded on in Chapter 22). Give students the opportunities to read, hear, talk, write, see, draw, think, act, and feel new material into their system. In other words, involve as many senses and parts of the brain as possible in their learning. If, as is commonplace, students first read or listen to the material, have them take notes on it, discuss it, concept-map it, free-write about it, solve problems with it, or take a quiz on it (see Chapter 22).
8. Reviewing learned material spaced over time facilitates learning better than does cramming in one long session (Brown et al., 2014; Butler et al., 2014; Cepeda et al., 2006; Dunlosky et al., 2013; Hattie, 2009; Rohrer & Pashler, 2010; Winne & Nesbit, 2010). This is called *spaced* or *distributive* practice (see principle 10). Build in activities and assignments that have students review and practice retrieving the same material at spaced intervals.
9. People learn better when newly learned information is *interleaved* with other information (Butler et al., 2014; Dunlosky et al., 2013; Rohrer & Pashler, 2010). Interleave this review-and-retrieval practice by having students work with old material as they are learning new material.
10. People strengthen their memories of newly learned information when they practice retrieving the information, such as self-quizzes (see principle 18) (Brown et al., 2014; Dunlosky et al., 2013; Karpicke & Blunt, 2011; Roediger & Karpicke, 2006; Rohrer & Pashler, 2010; Winne & Nesbit, 2010).
11. Learning is facilitated by targeted feedback to improve performance in more practice (Ambrose et al., 2010). Build into your course plenty of opportunities for feedback, including low-stakes quizzes, practice tests, in-class exercises, and homework assignments that can both tell students how much they are really learning and give them retrieval practice. Provide timely, targeted feedback that students can use to improve their performance (see Chapter 23).
12. People learn from making and correcting mistakes (Najafi et al., 2014). Persuade students that errors are memorable learning opportunities by sometimes giving them the chance to correct their errors (see Chapter 19).
13. People can remember newly learned information longer when they have to work harder to learn it—a research area called *desirable difficulties* (Bjork, 1994; Bjork & Bjork, 2011; Brown et al., 2014; McDaniel & Butler, 2010). Integrate *desirable difficulties* into your students' learning. These can help them generate multiple retrieval paths and stretch their abilities (Persellin & Daniels, 2014). Methods include having students recast text material into a graphic format such as a concept map; giving them frequent quizzes; varying the conditions and location of their practice opportunities; having them transfer new knowledge to new situations; assigning especially creative, inventive, and challenging tasks to small groups; and

holding your students to high standards (e.g., refusing to accept or grade work that shows little effort). However, be reasonable and don't use yourself as the standard. Very few students will learn your field as quickly as you did or choose the life of the mind as you have.

14. People learn better when the material evokes emotional involvement (Leamnson, 1999, 2000; Mangurian, 2005; Zull, 2002, 2011). Motivate and reinforce learning with emotions. Make a learning experience dramatic, humorous, surprising, joyous, maddening, exciting, or heart-wrenching. Integrate engaging problem-solving and experiential learning opportunities into your courses. Let students reflect, debate, consider multiple viewpoints, record their reactions to the material, and work in groups on gripping material.
15. People learn better when they have adequate sleep; exercise regularly; and feel they are in a safe, fairly stress-free environment (Zakrajsek, 2022; expanded on in Chapter 7). Be sure your students are aware of these biological imperatives to learning.

When even some of these research-based principles are employed in a course, students attend classes at a higher rate, are more engaged, and learn twice as much as students in a lecture-based course taught by a seasoned instructor (Deslauriers et al., 2011).

HOW STRUCTURE INCREASES LEARNING

Every field of study has a system of patterns that make up a structure. An essential aspect of being an expert is to identify and then use that structure to advance the field. Even not knowing your area of expertise, we do know it has structure. Without some kind of structure, there would be no way to organize newly learned information or even know which information to learn. As an example, stop reading for 30 seconds and look around the room where you are working, taking in any sound you hear; everything you see; and what you feel, from sitting or from your hands on the desk. Take a moment to process your discoveries. Then, look around the room again, but this time imagine you are an interior designer. What new elements jump out at you? What if you looked as a carpenter, a custodian, or a thief? Each person processes the same space differently, according to a particular field's structure, which helps the viewer decide which information in the environment to attend to and how it fits together with other information. This is true for looking at a room and true for anyone learning in a given field. One of the largest, and arguably most critical, challenges in teaching is to help novices see the structure of your field as professionals do, in a way that makes sense professionally and personally, and ultimately helps them to organize future information for easy access and understanding.

With the proliferation of information on the internet, and the speed at which information is increasing, it is becoming very easy to find isolated bits of information. When we (the authors of this book) began teaching (which we admit was before the internet was available to the public), much of our job as faculty members was to teach students the information of our field. That is no longer necessary. Students are experts at finding "information." Students can find people's phone numbers, the capitals of countries, the years of historical events, directions from one place to another, an area's major industries, election results, and just about anything you mention in class. Suppose you and your 17-year-old child are sightseeing and walking through a historic district and begin to think about finding a place to eat. You stop in front of a restaurant, look in the window to see how busy they are, and then glance at the posted menu by the door. You turn to your teenager (who is looking at their phone) and say, "This place looks pretty good." Your child replies, "They have great reviews, and they have some specials that sound fantastic. They are a bit busy tonight, but I just got us a reservation for 30 minutes from now. They have a link to a

statue in a park right around the corner that looks interesting. We could check it out and be back in 30 minutes." The amazing thing is that this is not an exaggeration. Tell your students this hypothetical and ask them if this seems realistic. However, finding and learning individual bits of information is not the same as acquiring knowledge.

Our challenge, as educators, is to facilitate the acquisition of knowledge in our fields, knowledge as a structured set of patterns that we have identified through careful observation, followed by reflection and abstraction—a grid that we have carefully superimposed on a messy world so we can make predictions and applications (Kuhn, 1970). Knowledge comprises useful concepts, agreed-on generalizations, well-grounded inferences, strongly backed theories, reasonable hypotheses, and well-tested principles and probabilities. Without knowledge, science and advanced technology wouldn't exist. With knowledge, there are no limits.

When students first begin to learn about a given area, they start to amass foundational information, struggling to identify what information is important and what is irrelevant. Be patient with them, as this is a necessary challenge before a structure is identified. From this perspective, memorization as a learning strategy makes sense. If our course instruction stops there, too many students leave the course viewing the material as disconnected facts and technical terms, no more meaningful, nor memorable than a set of websites full of information. The information they worked so hard to learn will be quickly forgotten.

One of our first tasks is to dispel misconceptions and faulty models students hold regarding the subject matter (Hansen, 2011; Svinicki, 2004). As novices, they are unable to identify central, core concepts and principles (Kozma et al., 1996), typically wandering through a body of information, picking up and memorizing what may or may not be important facts and terms, and using trial and error to solve problems and answer questions (Glaser, 1991). It would be challenging for anyone to figure out how to classify and approach problems at the conceptual level when all they see is a bunch of loosely related factoids (Arocha & Patel, 1995; DeJong & Ferguson-Hessler, 1996).

It is quite possible that your students have some accurate and foundational knowledge about the area being taught. This is good news, as learning is strongly dependent on preexisting knowledge. The brain is an amazing thing. When learning new material, you quickly look for elements that match some preexisting structure of information stored as a memory. If there is a close enough match, the new information is folded into the preexisting structure. This may happen in seconds, and without you even realizing it. If there is no similar preexisting structure (no prior relevant prior knowledge), students will struggle to comprehend and retain the new material (Bransford et al., 1999; Hanson, 2006; Svinicki, 2004; Wieman, 2007).

Another amazing thing about how humans process information is that we have the ability to extrapolate information to fill in the blanks in our understanding of phenomena. Some of these made-up connections stand up to scrutiny and testing and may be elevated to science. Charles Darwin, for example, did not observe mutations happening in nature; rather, he hypothesized their occurrence to fill in the explanatory blanks for species diversity. No one was around to watch the big bang, but the theory fills in quite a few missing links in cosmology. Astronomers have never directly observed dark matter (undetectable matter or particles that are hypothesized to account for unexpected gravitational effects on galaxies and stars), but they believe it makes up 30% of the universe. Not all imagined connections, however, stand the test of time or science. Superstitions and prejudice exemplify false patterns. Humans have been trying to influence natural phenomena for thousands of years, with any number of specialized behaviors. Many stereotypes about individuals in marginalized groups have been perpetuated based on a chance occurrence or willfully ignoring relevant information or context. This illustrates the importance of learning the proper way to use structures to create knowledge based on

the systematic study of information, rather than randomly grasping at bits of information.

The kind of deep, meaningful learning that moves a student from novice toward expert is all about acquiring the discipline's hierarchical organization of patterns that make up its mental structure of knowledge (Chi et al., 1982; Royer et al.,1993). By their very nature, knowledge structures are hierarchical. The general terms, core concepts, and propositions serve as a foundation for knowledge that is conditional, specific, and derivative. Experts understand and exploit the complexity of this hierarchy.

Given the amount of time students are in our course or courses, it is highly unlikely we can help them to become experts in a year or two, or even four. So, what can you do? One very solid option is to make the organization of our knowledge explicit by providing our learners with an accurate, ready-made structure for making sense of our content and storing it. Following are some strategies you can adopt and adapt to help you help your students begin to learn the structures of your field. In so doing, you can begin to move students from being purely information-seekers to being individuals who better understand how information fits into a well-defined structure that will aid their learning and help them develop content knowledge:

- At the beginning of the term, ideally in the first week, surface their understanding of the material they are about to learn. This can be done with a background knowledge probe (Angelo & Cross, 1993). Ask questions that require students to retrieve, articulate, and organize what they already know (or think they know) about your course material. This will allow you to address misconceptions in a supportive way at the appropriate time, explain why their position is incorrect, and show them a mental model that is more plausible, useful, and convincing (Baume & Baume, 2008; Taylor & Kowalski, 2014).
- Give students the big picture as early in the course as possible. The clearest way to show this is in a graphic syllabus (see Chapter 5). Carry through by presenting your content as an integrated whole, that is, as a cohesive system of interpreting phenomena rather than an aggregate of small, discrete facts and terms. Keep referring back to how and where specific topics fit into that big picture.
- Help students to see an overall structure for the course material by providing the logical sequencing of your learning outcomes for them. A flowchart of the student learning process for a course is called an *outcomes map* (see Chapter 2).
- Help students see the difference between information and knowledge. The previous discussion of the topic, as well as the next section of this chapter, supplies some useful concepts and vocabulary for explaining the difference.
- Teach students the thinking structures that your discipline uses—for example, the scientific method, the diagnostic process, the rules of rhetoric, basic logic (the nature of fact, opinion, interpretation, and theory), and logical fallacies. Where applicable, acquaint them with the competing paradigms (metatheories) in your field, such as the rational versus the symbolic interpretive versus the postmodern perspectives in English literature, pluralism versus elitism in political science, functionalism versus conflict theory in sociology, and positivism (or empiricism) versus phenomenology in social science epistemology.
- Show your students some of the fundamental patterns in your discipline and teach students about chunking to help them become more proficient in managing the landslide of new material. These thinking processes will help them identify conceptual similarities, differences, and interrelationships while reducing the material to fewer, more manageable pieces (Hanson, 2006; Wieman, 2007).
- Visuals are powerful learning aids (Hanson, 2006; Wieman, 2007). Whenever possible, furnish students with graphic representations of theories, conceptual interrelationships, and knowledge schemata—concept maps, mind maps, diagrams,

flowcharts, comparison-and-contrast matrices, and the like. It is also helpful to have students develop graphic representations of material to clarify their understanding of the material.

THE COGNITIVE DEVELOPMENT OF UNDERGRADUATES

Many believe that education is primarily about content. It starts in early school years with the question after school, "What did you learn today?" Content is certainly important, but it is even more important to learn the processes necessary to think more deeply. Most students, even the brightest of students, often begin their studies with serious misconceptions about knowledge in general and the discipline specifically (Hansen, 2011). Dispelling these misconceptions is an important part for students to mature intellectually. As an instructor, you have the opportunity—some would say the responsibility—to lead them toward epistemological maturity.

Psychologist William G. Perry (1968, 1985) formulated a theory of the intellectual and ethical development in which college students progress through four major stages on their way to the apex of cognitive functioning. The four stages are subdivided into nine positions, but for this introduction we will stick to the four stages. Students begin college in the stage of dualistic perspective and may, depending on their instruction, advance through the stages of multiplicity, relativism, and commitment (definitions are given in what follows). The research supporting the model accumulated rapidly, making Perry's theory a leader in cognitive development of undergraduates.

Perry developed his theory using a sample of mostly male students, but some years later, researchers, notably Baxter Magolda (1992), focused on female students. Baxter Magolda identified four levels of knowing—absolute, transitional, independent, and contextual—roughly parallel to Perry's stages. One important difference is that the females in Baxter Magolda's studies followed a more relational pattern, whereas the males in Perry's work were more abstract in their thinking. Table 1.1 displays both models.

Although Perry's framework of development applies across disciplines, a student's level of maturity may be more advanced in one discipline than another. For example, we shouldn't assume that a cognitively sophisticated senior in a physical science major has a comparable understanding of the nature of knowledge in the humanities. How far and how rapidly students progress through the hierarchy depends largely on the quality and type of instruction they receive. It is this flexible aspect of Perry's theory that has made it particularly attractive and useful. The schema suggests ways that we can accelerate undergraduates' intellectual growth although there is no guarantee that everyone will reach the top.

We begin with *dualism*, the lowest of the Perry's stages of cognitive development. Many first-year students enter our courses in this state. (Of course, there are people at all ages stuck in this stage.) Perry used the term *dualism* to describe students' thinking at this stage because they perceive issues in the world as fitting into one of two options: black or white, up or down, day or night. Dualism makes life simple. With only two options, there is little uncertainty. Learning, by this view, is simply accumulating the facts, as they look to be cleanly identified. Unfortunately, simplicity comes with a high cost. Much detail is lost when we cognitively put concepts into one of two boxes. To move students to a higher cognitive level, we teach them that although issues can be simplified by thinking of only the two extremes, the world is much more complex than that.

Students who advance in their learning leave dualism and enter the cognitive stage of *multiplicity*, where they realize there are conflicting opinions from others, and it is best to trust one's "inner voice." Students come to realize that the field they are studying rarely has definitive answers. Early in the stage of multiplicity individuals believe that

Table 1.1 Stages or Levels of Student Cognitive Development

Perry's Stages of Undergraduate Cognitive Development	Baxter Magolda's Levels of Knowing
1. *Duality*: Black-and-white thinking; authorities rule	Absolute knowing
⇩ *Uncertainty*	
2. *Multiplicity*: Poor authorities or temporary state	Transitional knowing
⇩ *Uncertainty as legitimate, inherent*	
3. *Relativism*: Learn to evaluate solutions	Independent knowing
⇩ *Standards of comparison*	
4. *Commitment* (tentative): Best theory available	Contextual knowing

everyone has a right to an opinion. This is the stage where people might "agree to disagree" and move on. Some students believe that, for coursework, an instructor's exercise is simply designed to ultimately lead them to the one true answer. As students advance through multiplicity, they accept the notion that genuine uncertainty exists, but only as a temporary state that will resolve itself once an authority finds the answer.

With additional work, the next move is to the stage of *relativism*, where students make an about-face and abandon their faith in the authority's ability to identify the truth. Ambiguity becomes a fact of life, because humans develop the positions chosen and the facts identified as support, and humans can make mistakes. In brief, students become relativists with the realization that there may never be one true interpretation or answer. Cognitively, students see knowledge as relativistic and contextual, but with qualifications. They may reserve dualistic ideas of right and wrong as subordinate principles for special cases in specific contexts. Thus, even in a relativistic world, they may permit certain instances where facts are truly facts and only one plausible truth exists.

The final stage of cognitive development is *commitment*. At this level students integrate the knowledge they have acquired with their personal experiences and reflection of the issues at hand, the knowledge acquired, and their lived experiences. Individuals in this stage are willing to change their position, if they acquire new information and have time to reflect on the known situation.

This provides a brief summary of Perry's states of cognitive development for undergraduates. As noted at the beginning of this section, students may be at the duality level in one discipline and at the commitment level in another. The same phenomenon can be seen in individuals of all ages. For example, a physician may commit to a specific set of values with respect to medical professionalism (commitment), and at the same time only fly AirVermont because they strongly believe that other airlines fly unsafe planes (duality). Because individuals can be

at different cognitive levels for different areas, it is important to not overgeneralize the cognitive functioning you see in one area to other areas. This is particularly true with respect to issues of diversity and equity. Students raised in families with minimal educational experiences and resources may have been exposed to dualistic thinking their entire life. As a result, in a discussion of political positions, this student may have a solid dualistic level of thinking. At the same time, they may be at the stage of relativism when it comes to the economy.

It is important to note that students do not typically move from one level to the next on their own. That is something for which they typically need a skilled facilitator. This is where you come into the picture. There are evidence-based ways to move students to higher levels of cognitive growth, as described in the next section.

ENCOURAGING COGNITIVE GROWTH

Nelson (2000), a leading authority on developing thinking skills, contends that we can facilitate students' progress through these stages by familiarizing them with the uncertainties and the standards of comparison in our disciplines. He and many others (e.g., Allen, 1981, in the sciences) have achieved excellent results by implementing his ideas. (Kloss, 1994, offers a somewhat different approach tailored to literature instructors.)

Exposure to uncertainties in our knowledge bases helps students realize that often there is no one superior truth nor can there be, given the nature of rational knowledge. Here they see that even experts in the field must search for answers. This realization helps lead them out of dualistic thinking and through multiplistic conceptions of knowledge. Once they can understand uncertainty as legitimate and inherent in the nature of knowledge, they can mature into relativists. Instructive examples of such uncertainties include the following: (1) the range of viable interpretations that can be made of certain works of literature and art, (2) the different conclusions that can be legitimately drawn from the same historical evidence and scientific data, (3) a discipline's history of scientific revolutions and paradigm shifts, (4) unresolved issues on which a discipline is currently conducting research, and (5) historical and scientific unknowns that may or may not ever be resolved.

Our next step is to help students advance beyond relativism to making tentative commitments and progress toward cognitive maturity. To do so, students need to understand that among all the possible answers and interpretations, some may be more valid than others. They must also learn why some are better than others—that is, what criteria exist to discriminate among the options, to distinguish the wheat from the chaff. Disciplines vary on their criteria for evaluating validity. Each has its own metacognitive *model*—that is, a set of accepted conventions about what makes a sound argument and what constitutes appropriate evidence. Most students have trouble acquiring these conventions on their own; they tend to assume that the rules are invariable across fields. Nelson advises us to make our concepts of evidence and our standards for comparison explicit to our students.

By the time students are solidly in the stage of relativism, they are hungry for criteria on which to rank options and base choices, so they should be highly receptive to a discipline's evaluative framework. To encourage students to reach commitment, we can provide writing and discussion opportunities for them to deduce and examine what their initial commitments imply in other contexts. They may apply their currently preferred framework to a new or different ethical case, historical event, social phenomenon, political issue, scientific problem, or piece of literature. They may even apply it to a real situation in their own lives. Through this process, they begin to realize that a commitment focuses options, closing some doors while opening others.

We should remind students that they are always free to reassess their commitments, modify

them, and even make new ones, but with an intellectual and ethical caveat: they should have sound reason to do so, such as new experience or data or a more logical organization of the evidence, not just personal convenience.

Bringing Perry's and Nelson's insights into our courses lays out a genuine challenge for us to consider. Students in any one class may be at different stages, even if they are in the same graduating class. Almost all first-year students fall in the first few positions, but juniors and seniors may be anywhere on the hierarchy. Students may also be at different stages for different parts of the course. It may be wisest, then, to help students at the lower positions catch up with those at the higher ones by explicitly addressing knowledge uncertainties and disciplinary criteria for selecting among perspectives and creating opportunities for students to make and justify choices in your courses.

Keep your students' cognitive growth in mind as you read this book. If you use the outcomes-centered approach to designing a course (see Chapter 2), you could select a certain level of cognitive maturity as a learning outcome for your students.

TEACHING TODAY'S STUDENTS

It is absolutely essential to keep in mind that in each course you will have a wide variety of students. Sitting before you when the semester begins will be first-generation college students, National Merit Scholars, students on the autism spectrum, and students with vastly different lived experiences. You will have students struggling with depression, anxiety, home sickness, attention deficit disorder, cognitive impairment, and schizophrenia. There will be students who start working on a semester-long paper the day it is assigned and others who will start the day before it is due. Some students love working in groups and others will groan in disapproval if you utter the word "group." This is a lot, and the longer you teach, the more you will see. The good news is that there are tools and resources to help you. In addition, if you work at being a good teacher, you will continue to get better at helping this wide variety of students.

The vast majority of your students will be in the Generation Z cohort (or Gen Z, iGen, or Zoomers). The birth dates being used to define this generation are 1995/1997–2012 (Dimock, 2019). Approximately 35% of Gen Zers know someone who identifies with gender-neutral pronouns (Parker et al., 2019), and using gender-neutral pronouns helps to establish a more inclusive classroom. Millennials were noted as being the most diverse generation ever, and Gen Z is even more diverse (Dimock, 2019). Members of Gen Z are considered the first true digital natives, in that they have not only had internet access their entire lives but also likely do not remember life before the smartphone (Parker & Igielnic, 2020). These students favor educational experiences that blend online and face-to-face teaching, working in groups and independently, and experiential learning (Schroth, 2019).

Gen Z students also lived through the COVID pandemic at an important time in their lives with respect to social development. This will likely have an impact on their social interactions at school and how they view the world. At the writing of this book, it is too early to determine the extent of the impact the pandemic had on Gen Z students' learning, but it is reasonable to assume there will be a lasting impact.

The reason we point out the importance of considering the diversity in your course is that students struggle with many different issues. For example, average graduation rates at 4-year institutions are 74% for Asian students, 64% for White students, 40% for Black students, and 39% for American Indian/Alaska Native Students (National Center for Education Statistics, 2019). Similarly, only 56% of first-generation college students complete a baccalaureate degree, compared to 74% of those students who had a parent go to college (Ives & Castillo-Montoya, 2020). Mental health is another increasingly disconcerting issue for Gen Z students, particularly among some subgroups. For example, 86% of LGBTQIA+ students report experiencing

anxiety, 84% suffer from depression, and 75% express concerns about coming out to family (Carrasco, 2021).

Given the struggle many of our students face, particularly in groups that have not been well represented in colleges in the past, it is helpful to keep in mind a quote attributed to Ian McLaren, "Be kind; everyone you meet is fighting a hard battle" (Quote Investigator, n.d.). This does not mean you should have lax standards or allow students to do halfhearted work. The point is that it is important to do your best to create a community, give students an opportunity to work with one another, create a way for students to give you feedback, and make sure your standards are clear. Helping such a diverse group of learners is a challenge, but when you are successful it is an important example of teaching at its best.

MEETING THE CHALLENGE

Being an effective teacher takes a great deal of work. Higher education, as any professional field, is changing all the time. That said, learning was not a strong focus in higher education until the mid-1990s, but then a strong shift began with the publications of Barr & Tagg's (1995) *From Teaching to Learning: A New Paradigm for Undergraduate Education* and Boyer's (1997) book, *Scholarship Reconsidered*, in which he proposed the entire scholarship of teaching and learning (SoTL). As a result, there was an increase in the number of higher education institutions with teaching and learning centers, higher faculty standards for teaching effectiveness, and an explosion of research on how students learn and respond to different instructor behaviors, teaching methods, and instructional settings. Faculty began to receive more credit for doing work on instructional strategies and books, such as the first edition of *Teaching at Its Best*, became important resources.

This book, *Teaching at Its Best* (5th edition), draws on and integrates much of the research on teaching and learning into a practical reference on the most effective approaches to use for different types of learning outcomes, providing opportunities for faculty members to develop a wider variety of teaching strategies, and a better understanding of how students learn. Overall, this book is designed to help you to be a better teacher. In so doing, you will help even more students to be successful in their studies. The more students we can reach, the fewer students are left behind or fail to reach their potential. Learning new teaching strategies and finding teaching resources is sometimes referred to as "building your teaching toolbox." As you build out your toolbox, you will be moving ever closer to teaching at your best.

REFLECTION QUESTIONS

Reflection Question 1.1: Who will your students likely be next semester? What do you know about the composition of students who are likely to be in your next course (e.g., first-generation, full- or part-time workers, caregivers, cultural backgrounds, etc.)? How can you use this knowledge of other commitments and priorities to meet your students where they are in structuring your course?

Reflection Question 1.2: In the section "How Structure Increases Learning," we discuss systems of patterns that make up any field. These structures may share similarities, but there are also certainly unique aspects. Reflect on your field of expertise and the structures that exist. If you cannot think of any, ask colleagues in your same field if they have ever noticed any specific structure to the discipline, perhaps in reading scholarly articles or textbooks.

Concept Into Practice: In the section "How People Learn," there is a list of 15 findings about how human learning works. Select one from an area you had not thought about previously with respect to teaching. It is important that this is something new for you. After you have selected one, set a timer

for 30 minutes. In that time, learn as much as you are able about the topic selected. Reflect on how learning something outside your discipline felt and also how quickly you can learn something new about teaching. As instructors, most of us rarely pursue academics outside our own field, and it's easy to forget how our students feel. Finish by outlining how you will begin to implement the strategy that you selected and learned a bit more about.