CHAPTER 2

Expectations

Recognizing How Our Beliefs Shape Our Behavior

ex•pec•ta•tions |ˌekspekˈtāSHəns| noun: A set of strong beliefs surrounding future outcomes and anticipated results. • A demand we place on others. • What we regard as likely to happen given certain actions. As a culture shaper, expectations operate as "belief sets" or "action theories" that influence our own efforts in relation to the achievement of desired goals and outcomes. In this way, expectations not only set our course but also act as an internal compass that keeps us moving toward our goal. It is important to note that this departs from the way teachers more typically think of "expectations"—that is, as explicit expressions *of* standards used to direct and inform the behavior of others. It is our expectations *for* students, ourselves, and the learning process itself that form the foundation for the culture of the group.

Sitting in the back of Karen White's algebra classroom in suburban Colorado, I found myself growing increasingly uncomfortable. When I had interviewed Karen the year before about the possibility of observing in her classroom, she shared with me how important thinking was to her in her teaching. She had been through several professional development seminars about promoting "habits of mind" and enthusiastically rattled off the lingo associated with that program as she talked about her goals for students. She stressed the importance of metacognition to learning and discussed how she integrated writing and problem solving in mathematics. On the basis of these conversations, I was excited to see how these elements would play out in her classroom. However, observing in her class that first morning, I had a hard time finding moments when students actually were engaged in any thinking. Karen was extremely well organized, greeting each student at the door and getting the class started quickly and efficiently. She was firm but pleasant to all students, and managed the classroom with the efficiency of a seasoned teacher. But for all this order and efficiency, there was something missing. Why didn't this feel like a thoughtful place? Like a culture of thinking?

As I observed class period after class period that first day, Karen communicated very clear guidelines and standards to every set of students. Each homework question was worth a point if it was attempted. You could still get some points for homework even if it were late, so you should always do it. Scores were collected each day and point accumulations were publicly posted at the end of each week so that every student would know exactly where he or she stood in terms of a final grade. If you didn't understand a concept, ask. Karen assured the class that she was "the best explainer in the West" and would be happy to supply a second or third explanation until a procedure was clear. In the end, doing the work and trying would guarantee that a student would pass the course—and not have to repeat it next year—even if one wasn't any good at mathematics. Thinking was mentioned, but not in a way directly connected to the learning at hand. For instance, there were reflection journals to encourage "metacognition," but these were used to record how students were feeling about their performance on tests and assignments

rather than a careful analysis of their learning. There were "problems of the week" that students would do independently outside of class, but these problems were opportunities to gain more points rather than a well-integrated part of students' learning.

Throughout that first week of school and on into the school year, Karen was reliably consistent with her students. Still, the thinking remained largely elusive, and the culture seemed never to approach a true culture of thinking. Classes started promptly with a review of homework. New procedures were cheerfully explained, questions answered, and new practice sets given for homework. True to her word, scores were posted on the bulletin board beside the door each week, and students were informed at the beginning of class if any assignments were missing or late. At times it seemed like each student in the class had made an internal calculation regarding how much attention needed to be paid to complete the homework successfully or prepare for the looming test. Each student operated just slightly below this threshold and rarely stretched beyond it, creating an atmosphere of compliance and passivity.

"Order." "Clarity." "Predictability." These were the words students and colleagues used to describe Karen's classroom and teaching style. The other word that kept coming up was "expectations." Karen had clear expectations of students. Students knew what to expect in her class. Indeed, these evaluations seemed to hold with my own observations. Karen did have very clear expectations, communicated effectively and upheld relentlessly in an admirable fashion. But somehow these expectations, the clearest manifestation of what Karen's classroom was like, seemed to be standing in the way of creating a culture of thinking. How could that be? Why would having such clear expectations for students' behavior and performance inhibit their development as thinkers?

To understand how this could happen and to understand better how expectations operate as a cultural force in learning groups, we have to make a distinction between two types of expectations: directives and beliefs. In schools and classrooms, we often talk of expectations in terms of the behavioral actions and performance outcomes adults want from students. Our expectations *of* students. Such standards, expressed to anyone in a subordinate position, have the nature of a strong request or even an order. Think about these as top-down directives whose aim is to clearly define what the person in charge desires with respect to another's performance. To be clear, there is nothing inherently wrong with communicating such behavioral standards or criteria for assignments to students or subordinates. Effective teachers and leaders do this all the time and with consistency, as did Karen.

The second kind of expectations operates on a deeper, more systemic, and ultimately more powerful level. These are the expectations that are rooted in our beliefs about the

nature of things and how the world operates. In the context of a learning group, they are working theories about the nature of teaching, learning, thinking, schools, or the organization itself. Our expectations *for* students. These beliefs focus our attention, direct our action, and define our understanding of how things work. These beliefs form the basis for what my colleague David Perkins calls "action theories"—that is, theories about how our actions relate to obtaining desired results. Perkins (1999, p. 19) explains the utility of such theories: "We try to cope with the complexity and uncertainty of the mission of life through such action theories," and explains that their power comes from their compactness, simplicity, and efficiency. They are the "rules of thumb" and the "internal compass" with which we operate. This second layer of expectations is a constant influence on the actions of a teacher or leader, providing the underpinning for the more explicit, surface-level directives he or she might express.

After decades of research into how to create a theoretical model that would explain teaching behavior, Alan Schoenfeld and his colleagues at the Teacher Model Group in Berkeley developed a goal-oriented decision-making model of teaching (Schoenfeld, 2010). In this model, knowledge of a teacher's goals and beliefs provides the basis for understanding much, if not all, of a teacher's behavior. Indeed, Schoenfeld claims that "if enough is known, in detail, about a person's orientations, goals, and resources, that person's actions can be explained at both macro and micro levels. That is, they can be explained not only in broad terms, but also on a moment-by-moment basis" (p. iv).

Schoenfeld's model suggests that teachers do not so much work from a set of practices, either prescribed or ingrained, as they are guided profoundly and implicitly by their belief sets (what he calls "orientations") about teaching, learning, and the meaning and purpose of school. The power of these expectational belief sets helps explain why changing teaching is much more than giving teachers a new set of practices to deploy. In fact, teachers may employ a new method of instruction, only to find that it falls flat and doesn't achieve the kind of lift its proponents had promised. They then discount the method, ignoring completely how their expectational beliefs may have undermined the new instructional practices.

Back to Karen White's classroom: Why were her directives inhibiting the creation of a culture of thinking? Why should her clarity regarding behavioral standards and outcomes impede her efforts to create a culture of thinking, given that thinking was something she expressly valued? It wasn't that her directives were necessarily "bad" or "wrong"; it was that the action theories and beliefs that gave rise to them tended to be more inhibiting than facilitating of an agenda of thinking. Consequently, the deeper-level expectations, her action theories, on which she based her directives were not supportive

of an agenda of thinking. Peeling back Karen's surface directives to uncover the beliefs and action theories that lie beneath them, we can see why this is the case.

In Karen's very clear standards for students about points, grades, and keeping score, one sees a belief that school is about work and that students must be coerced or bribed into learning through the use of grades. You may recall that this was a recurring theme emerging from many people's stories of learning shared in chapter 1. In the way Karen planned and focused her classes, one sees the belief that learning algebra is primarily about acquiring knowledge of procedures rather than developing understanding, and that memorization and practice are the most effective tools for that job. This theory of action, "One learns through memorization and practice," made it hard for Karen to bring out and facilitate students' thinking. Instead, thinking existed as an add-on to the regular rhythm of the class, something she did as an "extra" to the regular work of the class. Through her strong focus on grades and passing the course, even if one is "no good at mathematics," Karen sent the message that our abilities are largely fixed and that "getting by" was all that some could hope to accomplish. One might not understand algebra, but with effort one could at least pass the course. Finally, in her efforts to promote order and control, certainly worthwhile and important goals in any classroom, Karen tilted the balance toward students' becoming passive learners who were dependent on her.

In this chapter, I'll explore five belief sets that act as action theories and lay a foundation *for* our expectations in learning groups. They can either facilitate a culture of thinking, though they can never fully ensure it, or act as an inhibiting challenge to that development. The five belief sets are as follows:

- Focusing students on the learning vs. the work
- Teaching for understanding vs. knowledge
- Encouraging deep vs. surface learning strategies
- Promoting independence vs. dependence
- Developing a growth vs. a fixed mindset

By way of introducing these, we've taken a brief look at how each of these sets of beliefs played out in Karen White's teaching. We'll now explore them more fully to understand how these specific expectations for students (as opposed to *of* students), which operate as our guiding action theories, are important to establishing a culture of thinking. You'll notice that I've framed each of these belief sets as a natural tension. I've done this because forming a powerful theory of action for oneself is not a simple matter of merely adopting a nice-sounding platitude some author spouts off. Rather, the creation of a real-world action theory demands that we acknowledge and try to reconcile for ourselves the pushes and pulls that exist in a given context. Only then can we know why we are coming down on one side or other. Furthermore, before any given belief is to fully exist as an action theory, we have to make the connection between actions and outcomes. Thus it is important to explore how a belief gives rise to a set of actions that then results in certain outcomes. Finally, we must recognize that there are other possible goals, beliefs, and expectations out there competing as possible action theories. Having clear expectations—that is, the kind of expectational beliefs that guide our own and students' actions—requires a conviction on our part. We must first set and then calibrate our internal compass if we want it to act as a reliable guide.

FOCUSING STUDENTS ON THE LEARNING VS. THE WORK

The metaphor of work—learning as work, students as workers, and classrooms as workplaces—is well entrenched in our notions of schooling and education. This shouldn't be surprising given that public education began to take hold around the world at the same time that child labor laws were beginning to be instituted. The writings of Charles Dickens, most notably *Oliver Twist*, served to publicize the issue of child labor, and Great Britain subsequently led the way in passing a series of reforms to curb child labor during the nineteenth century. In 1821, the first public high school was opened in Boston. Just a decade later, the New England Association of Farmers, Mechanics and Other Workingmen passed a resolution stating, "Children should not be allowed to labor in the factories from morning till night, without any time for healthy recreation and mental culture" (timetoast, 2011). Four years later, the first US law governing compulsory attendance in school was passed in Massachusetts. Still, it took over a century before the first US federal law regulating children's work was instituted in 1936. We see a similar progression of laws occurring throughout Europe, Australia, and Canada. Thus children's work moved out of the factory and farmyard and into the school, with teachers becoming the new managers, bosses, and overseers.

As Hermine Marshall (1988) points out, the work metaphor has been firing on all fronts in education ever since these early days. It guides the research that has been done in education, influences the design of teaching methods, impacts the way in which we organize schools, and shapes the form of interventions. Just take a look at the language used in schools; we are swimming in a sea of work-related metaphors. Principals get called "chief academic officers." Researchers assess "time on task" and look for "value added" in terms of student output. Prospective teachers are trained in "classroom

management" and held "accountable for results." Students are taught "work habits" and receive "rewards" for their performance. Students are issued workbooks, given work time or work periods, and are assigned seat work and homework. In a London school, a group of teacher researchers (Claxton, Chambers, Powell, & Lucas, 2011) sat in on classrooms to listen for just how prevalent teachers' use of the words "work" and "learning" were. To their astonishment, "work" was used forty-nine times more often than was "learning." The ubiquity of the work metaphor for schooling serves to ingrain it not only in our language but in our psyche as well, causing few to question it.

But why should this matter? What's wrong with work or being a good worker? Doesn't one have to work to learn? Why vilify the notion of work? Isn't work noble and worthwhile? Can't we do good and meaningful work? And isn't this focus on language just splitting hairs anyway? What difference does it make if a teacher asks, "Is your work done?" or "Where are you in your learning?" To address these questions, we must first understand that what is at issue here isn't merely a selection of words and phrases but a more fundamental choice we are making in terms of how our energies and those of our students get channeled.

In their seminal book, *Metaphors We Live By*, George Lakoff and Mark Johnson (1980) make the case that the metaphors we use do not merely pepper and enliven our speech; they help us organize our experience and create our realities. Although metaphors may initially grow out of our perceptions or derive from the apt and fitting connections we make, eventually their use over time by individuals and groups comes to shape the way we perceive the world. Lakoff and Johnson take this a step further, asserting that metaphors actually "structure our actions and thoughts. They are alive in the most fundamental sense: they are metaphors we live by" (p. 55). Thus, when educators employ a work metaphor, they are framing and shaping the experience of the classroom, focusing students' attention on the completion of work rather than helping them focus on the learning that might be achieved. As Marshall (1990) explains, "Metaphors 'set' or structure both the way classroom problems are perceived and the solutions that are proposed. . . . If classrooms are seen as workplaces, many people believe that their 'productivity' can be improved by rewarding greater efficiency and better products, that is, higher test scores. The solution suggested by this metaphor, however, disregards whether what is produced is meaningful learning. For some teachers, meaningful learning seems to be secondary to maintaining the work system" (p. 96).

In work-oriented classrooms (Marshall, 1987), teachers and students are focused on work completion. We hear students asking questions about the work: "How long does this have to be?" "Will this be on the test?" These aren't questions about the ideas or about the learning; they are about the work. Teachers then monitor students' work and hold them accountable for it, as we witnessed in Karen White's classroom. Of course, the underlying assumption is that the work will result in the learning. However, the way one frames a task often determines how one goes about accomplishing that task and what one is likely to get out of it. Try this quick thought experiment: Recall something you were asked to do by someone who was a higher-up or in a supervisory role, something that you just didn't see the point in doing. Now think about how you went about doing that task. That is what work feels like. It is done for someone else, not yourself, and the focus becomes completing the work, getting it done and over with, and possibly pleasing the superior. Now identify the flip-side example: Think of a time when someone did what you asked, but not what you intended. Why didn't that person do what you intended? It was most likely because he or she focused on the work rather than its purpose.

In contrast, in a learning-oriented classroom, teachers and students focus their attention on the learning as the priority, letting the work exist in context and serve the learning. The work is a means to an end, not an end in itself. What does this look like in practice? To begin, it means that teachers normally introduce a task or assignment by highlighting the learning that can potentially arise from it. Contrast this with the more common delineation of the assignment and all its requirements, which serves to focus students more on the task than on the learning. Next, teachers sustain and support the learning through their interactions with groups and individuals. When the purpose of the task is on the learning, teachers are also more likely to provide choice and options in completion of assignments as long as the learning is being achieved. In contrast, when the focus is on the work, students are often given less choice as teachers exert a greater degree of control.

In work-oriented classrooms, teachers "monitor the work," making sure everyone is on task and getting things done: "Are you finished?" "What number are you on?" "Are you ready to move on to question 4?" In contrast, when teachers are focused on learning, they spend their time with students "listening for the learning": "Tell me what you have done so far." "What questions are surfacing for you?" "What does that tell you?" Finally, we see a learning orientation in the way that teachers respond to and treat mistakes and errors. In learning-oriented classrooms, mistakes are seen as opportunities to learn, to grow, to rethink. In work-oriented classrooms, errors and mistakes are to be avoided because they indicate incompetence. Thus learning-oriented teachers often provide more descriptive feedback that informs learning, whereas work-oriented teachers tend to give more evaluative feedback as a judgment on performance.

Of course there is more nuance to developing a learning orientation and keeping students focused on learning than just these few tweaks. Teaching is a complex task, after all. However, making a clear distinction between work and learning helps us as teachers to keep our focus and that of our students on the learning. It allows us to reject the naive theory that "if I just keep students busy and on task, then they will learn" in favor of the more complex, "If I keep students focused on the learning, then I will be better able to monitor and assist their development of understanding."

To get a sense of how our big-picture goals, beliefs, expectations, and action theories influence and shape teaching behavior, consider an experiment conducted by researchers in Colorado (Flink, Boggiano, & Barrett, 1990). The researchers wanted to test the effects of teaching done with a focus on learning versus a focus on performance/work. They predicted that when teachers felt pressured to perform by an outside authority, then these teachers would be more likely to employ controlling teaching strategies as an instructor, thus impairing student performance. The researchers randomly assigned fifteen fourth-grade teachers to one of two teaching conditions. One group was given the instruction, "Your role will be to facilitate the children's learning how to solve the anagrams and sequencing problems. Your job is simply to help the students learn how to solve the problems." We can equate this with a learning orientation. The other set of teachers was told, "Your role will be to ensure that the children perform well on the anagrams and sequencing problems. It is a teacher's responsibility to make sure that students perform up to standards." We can equate this with a work orientation. These teachers then taught small groups of students, four to seven students per group, across a total of 267 students. All sessions were videotaped and evaluated for the presence of "controlling teaching strategies," such as hints, pressure, tenseness, and the use of evaluative criticism and praise.

The researchers were correct in their hypothesis. Under the pressure conditions, the teachers were more likely to use more controlling teaching practices, and this coupling of pressure on teachers with controlling practices led to impaired student performance. Keep in mind that none of the teachers were told how to teach. They were not told to be directive or controlling; they were only given a set of expectations by the researchers in the form of a simple statement. The story not to be missed here is that teachers' actions were shaped by the way the task of teaching was framed. The metaphor, the action theory in play gave rise to certain behaviors in teachers and subsequently in students. A work orientation didn't always lead to poor student performance, however. Nor did a teacher's use of controlling teaching strategies. It was the combination of the two that caused student performance to dip. Thus we see the power of facilitative expectations coupled with effective teaching practices. We must have both operating in tandem.

TEACHING FOR UNDERSTANDING VS. KNOWLEDGE

The words "understanding" and "knowledge" are ubiquitous when it comes to talk about learning, education, and schooling. However, the terms are somewhat ambiguous and can lead to confusion among people who think that the two are one and the same, or cause some to wonder what all the fuss and debate is about. For instance, the term "knowledge" can, on one hand, refer to the accumulation and storage of facts, procedures, and skills: *Do you know how to make a pie crust?* On the other hand, it can also be used in the broader sense of wisdom and more broad-based "modes of relating to the world" (Maleuvre, 2005): *He really knows his way around the kitchen.*

Likewise, the word "understanding" can be used in very different ways. Some thirty years ago when Madeline Hunter (1982) talked about "checking for understanding," she meant assessing students' basic comprehension or grasp of knowledge: *Do you understand the explanation I just gave on how to diagram a sentence?* However, the term "understanding" also can be used to express a much deeper and more complex level of learning, describing a state of enablement beautifully expressed by Jerome Bruner (1996): "Being able to 'go beyond the information' given to 'figure things out' is one of the few untarnishable joys of life. One of the great triumphs of learning (and of teaching) is to get things organized in your head in a way that permits you to know more than you 'ought' to. And this takes reflection, brooding about what it is that you know. The enemy of reflection is the breakneck pace—the thousand pictures" (p. 129).

None of these various meanings is in any way wrong or incorrect, and people are certainly entitled to define terms as they see fit. However, because ambiguity exists, before we go further we must define what we mean by understanding and how understanding is different from knowledge. Understanding requires knowledge, but goes beyond it. Understanding depends on richly integrated and connected knowledge. This means that understanding goes beyond merely possessing a set of skills or a collection of facts in isolation; rather, understanding requires that our knowledge be woven together in a way that connects one idea to another. This web of connections and relations becomes the vehicle for our putting ideas to work and seeing the applicability of our skills in novel circumstances and in the creation of new ideas.

David Perkins often speaks of understanding in terms of "knowing one's way around" a particular topic. This suggests that there are multiple sides of a topic to be navigated, and that we need always to be on the lookout for new perspectives and opportunities to explore. Understanding a particular topic then leads not just to familiarity but also to a state of enablement. In contrast, knowledge and skills can be possessed in isolation and

without the accompanying understanding that would permit us to use them flexibly and adaptively in new situations. Thus the metaphors for knowledge focus on possession, storage, and retrieval. Knowledge is seen as a commodity; it is something you have. This often leads to a binary notion of knowledge as something one either has or doesn't. In contrast, the metaphors for understanding focus on action: applying, performing, adapting, and so on. Understanding is viewed as a performance; it is something you do. Understanding often varies in degrees and context. It is decidedly nonbinary in nature, and in fact some might argue that understanding can never be fully complete and absolute.

In many classrooms, to reach for this kind of understanding—that is, an understanding that stresses exploring a topic from many angles, building connections, challenging long-held assumptions, looking for applications, and producing what is for the learner a novel outcome—represents a new, different, and sometimes even radical agenda. Teaching for understanding is not school as usual. In the 1990s, when the Spencer Foundation funded one of the largest-ever nongovernmental research projects in education, they recognized that teaching for understanding represented a new direction for both students and teachers. The aim of the research, carried out at Harvard Graduate School of Education, was to explicate a specific pedagogy of understanding. The rationale was that much of the previous research in education had focused on helping students acquire information and learn skills rather than develop understanding. Although a wealth of prior research had focused on how to structure, sequence, deliver, and assess gains in knowledge and skills, it was believed that to really develop understanding required new curriculum, new methods, and a different set of approaches—and this required a new line of research to uncover. As technology was advancing, globalization increasing, and whole new industries and new career trajectories forming, it was becoming increasingly clear that an educational focus on knowledge and skills alone wasn't going to take students very far in life.

The model that eventually emerged from the research analyzing and distilling what effective teachers did when they were trying to promote understanding came to be known as the Teaching for Understanding (TfU) framework. It delineates four essential elements to which teachers need to attend:

1. **Generative topics:** focusing the curriculum around big, generative ideas worth understanding
2. **Understanding goals:** identifying a small set of specific goals for understanding (as opposed to a list of things they want students merely to know)
3. **Performances of understanding:** designing a sequence of ever more complex performance tasks that require students to use their skills and knowledge in novel contexts
4. **Ongoing feedback:** providing a steady stream of ongoing feedback and assessment information that students can use to improve their performance

Sounds easy, right? Of course the reality of putting this in place in real classrooms requires a lot of new thinking and effort by teachers. But it also requires students to assume a new role as well. When teachers attempted to teach a TfU unit for the first time, many ran into problems because they didn't address the new set of expectations for learning with their students. The new goal, the new agenda, and the new expectations about what it would mean to be a learner in that class were an important subtext that was hidden. Students knew the game of acquiring knowledge and skills (some better than others), and they kept trying to apply those methods in this new context. Students were frustrated. Teachers were frustrated. All because the central expectations, the beliefs and action theories shaping the classroom, were not shared, discussed, and explored at the outset.

The definitions, goals, and teaching methods related to teaching for understanding may all make sense to you, yet you still might be uneasy with why this belief set is framed as a tension: teaching for understanding vs. teaching for knowledge. As we have seen, knowledge, skills, and information play an important role in understanding and are a necessary component of it. So knowledge is presented while teaching for understanding with an expectation that that knowledge will be used, applied, discussed, analyzed, transformed, and so on. The tension arises when the teaching of knowledge becomes the primary goal, which is often the norm in many classrooms. When this is the case, such an approach can, at worst, actually impede students' understanding or, at minimum, may lead us to gloss over the gaps in students' understanding.

Mathematics offers a classic example of how this plays out. Numerous studies of students' performance on basic mathematical tasks have linked errors to an overapplication of rule-determined behavior (Brown & Burton, 1978; Young & O'Shea, 1981). Although such overapplication and generalization is not uncommon in the learning process, it may be exacerbated by instruction that overemphasizes "learning the rules." However, the problem becomes even more extreme when students are asked to apply what they know to problem-solving situations. In the United States, a consistent finding from the National Assessment of Educational Progress is that students at all levels of testing (ages nine, thirteen, and seventeen) are generally able to show mastery of the procedures taught, but struggle to apply their knowledge to problem-solving situations

that are not clear-cut matters of applying a rule (Carpenter, Corbitt, Kepner, Lindquist, & Reys, 1980).

A long line of research in science education also has shown that merely imparting information to students does little to affect their understanding. In fact, students may be able to produce results on tests when simply asked to recall facts, but can't apply that knowledge to problem-solving situations or give explanations for common events. As Nickerson (1985) notes, "a superficial knowledge of how to manipulate formulas and solve textbook problems may suffice to carry one through standard course requirements" (p. 215).

Examples of these failures of "teaching for knowledge" achieved infamy in two Harvard-Smithsonian Center for Astrophysics series of videos, A Private Universe (1987) and Minds of Our Own (1997), in which Harvard University and Massachusetts Institute of Technology graduates showed that they didn't understand basic concepts related to the seasons, electricity, light, and plants. Others have documented how students' prior conceptions and real-world experience often stand in the way of their understanding of force (Minstrell, 1984), rates of change (Trowbridge & McDermott, 1981), projectile motion (McCloskey, 1983), and causality (Perkins & Grotzer, 2005).

In his book *The Unschooled Mind*, Howard Gardner (1991) showed how this problem of "teaching for knowledge," which has as an underlying metaphor of "teaching as transmission," leads to very superficial learning in all the disciplines, even among our best students. The point made by Gardner, and exemplified in the flesh by the Harvard-Smithsonian video interviews of Harvard and MIT graduates, is that students' lack of understanding is not a shortcoming of the students. These are the best and the brightest. It is a shortcoming of the teaching, specifically of a belief set and expectation that teaching for knowledge is our goal as educators.

ENCOURAGING DEEP VS. SURFACE LEARNING STRATEGIES

The preceding two expectations, that our classrooms will be about learning and that our collective goal will be the development of understanding, are certainly synergistic and share a natural affinity. However, it is important to keep in mind that they are still distinct goals to work toward. It is possible for a teacher to focus on the learning over the work yet still emphasize the acquisition of knowledge as the primary goal of that learning. Thus, although they are complementary, the goals of learning and understanding should be viewed as separate. Likewise, this third belief set is also a natural extension of the previous two. And, similarly, it cannot merely be assumed as naturally occurring as a result of taking on the previous two expectations.

Assuming that one has embraced the expectation that school is about learning and that the focus of that learning is on the development of understanding, it would be natural to then ask oneself, "So how will I get students there? What do I need to do differently to promote the development of understanding?" In the previous section, I briefly explained the Teaching for Understanding (TfU) framework, which serves as a partial answer to these questions. At the instructional heart of that framework lies the idea that the way one develops understanding is through an ever more challenging and demanding set of "performances"—that is, through activities that allow for both the development and demonstration of understanding. The central idea of the concept of understanding, that of action and going beyond, comes into play in designing such performances. Consequently, a major task for teachers who embrace teaching for understanding, whether they are using the TfU framework itself or not, is answering the question: What will I actually ask students to do with the skills and knowledge they are acquiring that will develop their understanding and push it forward?

Working with many teachers in applying the TfU framework to their teaching, I've noticed that people often get hung up on the idea of "performances," and wind up creating elaborate and complicated tasks. Frequently this gets associated with "performance assessments," and the focus shifts from developing understanding to demonstrating mastery of the content taught. The key to designing successful "understanding performances" is to step back a bit from both of these positions. Although a performance can be elaborate and complex, it need not be so. Understanding is built up of many small performances of ever-increasing complexity stitched together. Even though an understanding performance always provides a window into students' understanding, such assessments need not always be formalized and summative in nature. The key to designing performances that build understanding is asking oneself: What will learners do with the information and knowledge? How will I ask them to process it—that is, to interact, use, manipulate, or change it? It is the level of processing that is key to developing understanding.

Within the completion of any learning task, assignment, or activity, there exists a wide range of potential strategies any individual learner might employ, either independently or with support, in completing that task. Although many possibilities exist for how such strategies might be classified, identifying strategies by their *level of processing* has a long history within the field of cognitive science. Craik and Lockhart (1972) suggest that depth of processing affects recall, and propose a continuum ranging from the shallow to the

deep to classify students' processing. Marton and Saljo (1976) use this same notion to classify the approach students use in processing text as either deep or surface. Biggs (1987) builds on this work in proposing a framework for understanding students' motives and strategies for learning. Biggs proposes three levels: surface, deep, and achieving, with achieving being characterized as focusing on the behavior consistent with being a good student. Van Rossum and Schenk (1984) use different language to refer to similar constructs, calling surface-level strategies "reproductive" and referring to those that build understanding and require greater depth in processing as "constructive." In my work with teachers, I have found the simple language of "surface" and "deep" thinking to be intuitively useful. These words provide an easy metaphor for us to hold on to and work with as an action theory. Surface strategies focus on memory and knowledge gathering, whereas deep strategies are those that help students develop understanding.

In designing any episode of learning, effective instructors tend to prompt their students to employ certain modes of processing. This prompting can be done either explicitly as part of the assignment itself, as with the use of thinking routines (Ritchhart, Church, & Morrison, 2011), or implicitly by signaling the use of what have become commonly expected modes of processing within that learning group for completing such tasks. Strategies for creating these kinds of episodes will be discussed more in the chapters focusing on the cultural forces of routines and opportunities.

It is important to note that two less effective alternatives to this explicitness exist, and unfortunately these tend to dominate. Perhaps most common is that no processing is signaled or required at all. Here instructors are operating on the naive assumption that presenting information is all that is required of them, assuming that students themselves must do whatever processing is needed. Such individuals should label themselves as presenters or lecturers, as a true teacher must assume responsibility for fostering learning. If students merely sit through lectures or presentations, or do the reading without actively processing it, they are unlikely to learn much.

Another common classroom scenario exists in which the general need for processing may be indicated by the task, but there is an absence of explicit directions and supports to use specific modes of processing. When this occurs, which is all too often, students are likely to employ whatever processing strategies they have readily at their disposal or are most comfortable with using, and that have yielded some success for them in the past. This accounts for why "strong" students are often successful even with "poor" teachers, but "weaker" students will flounder in such situations.

It perhaps seems obvious that teaching for understanding would require deep processing. However, this expectation for deep processing isn't automatic. An excellent example of this gap can be found in a study of portfolios submitted by US teachers seeking certification as highly accomplished teachers from the National Board for Professional Teaching Standards (NBPTS) in the area of Early Adolescence/Mathematics (Silver, Mesa, Morris, Star, & Benken, 2009).

The NBPTS certification process, run by a nongovernmental professional group, is multifaceted and comprises video evidence, a test of teacher's content knowledge, and a portfolio consisting of artifacts (tasks, student work, and teacher reflections) that highlight "Developing Mathematical Understanding" and "Assessing Mathematical Understanding." Hence, these samples highlight the best work (chosen by the teachers) of teachers who believe they deserve special recognition as highly accomplished teachers. Furthermore, the requested samples clearly indicate that understanding is to be the focus of the work submitted. Therefore, one might expect that such a highly selective sample of classroom tasks from a highly selective group would contain clear evidence of "deep processing," right?

In an assessment of the tasks submitted by teachers applying for NBPTS certification, researchers found that less than 30 percent of the Developing Mathematical Understanding tasks submitted by teachers were rated as "high cognitive demand" tasks involving deep processing. When it came to tasks dealing with "numbers and operations," the major topic of emphasis in most math classrooms, only 10 percent of submitted tasks were judged high demand. High-demand tasks were those that require students to explain, describe, justify, compare, assess, make choices, plan, formulate questions, or work with more than one representation. In contrast, low-demand tasks ask students to make routine applications of known procedures or present what could be a demanding task in a highly structured or constrained way (breaking it into nondemanding subtasks) so that students were no longer asked to think.

When researchers analyzed the "Assessing Understanding of Mathematics" tasks, they did tend to be a bit more challenging, with 38 percent being rated as high-demand tasks. However, the majority were still low demand, and within the category of numbers and operations, only 20 percent were rated as high demand. The researchers note, "The fact that about half of the teachers in our sample failed to include in their portfolio entries even a single task that was judged to be cognitively demanding can be viewed as disappointing because teachers were showcasing their best practice" (p. 520).

Although it can certainly be argued that this is only a single study from the United States and only within the area of mathematics and therefore should not be overgeneralized, other researchers have found similar patterns in the teaching of mathematics and other subject areas (Hiebert et al., 2005; Newmann, Bryk, & Nagaoka, 2001; Wagner,

2008). The more important point is that one cannot assume that a teacher's expectation for understanding will automatically indicate that that teacher will have a classroom dominated by deep-level processing strategies. The expectations are complementary but distinct. Furthermore, as the goal of understanding becomes more widely accepted, it is likely to receive only lip service by many. Its true realization will depend on the rigorous adoption of deep learning strategies as the norm rather than the exception in classrooms.

ENCOURAGING INDEPENDENCE VS. DEPENDENCE

We have seen that there is a clear link between expectations for learning, understanding, and use of deep learning strategies. Although each is distinctive and must become an explicit part of one's belief set, the action theories that evolve from their adoption are synergistic. If one truly embraces understanding in a full and complete sense, then learning will be the focus, and deep-level learning strategies will be important in achieving that goal. At the same time, we have seen that one can seek to foster learning without being focused on understanding. Likewise, one can embrace understanding and not necessarily be employing the deep learning strategies needed to foster it. The encouragement of student independence rather than dependence on us doesn't cleave as closely to the preceding expectations, however. Although in no way in conflict with the previous set of beliefs, fostering independence is most clearly a discrete goal.

Recall the study done by Colorado researchers (Flink et al., 1990) examining the effects of teaching done with a focus on learning versus a focus on performance/work. They found that it was the combination of a work orientation with controlling teaching behaviors—thus a promotion of dependence—that was connected with a decline in students' performance. However, controlling teaching—that is, teaching that is more directive and evaluative in nature—combined with a learning orientation didn't result in any such decline, but instead resulted in a very slight increase. Furthermore, the teachers in the pressured-to-perform group were rated as being more enthusiastic, interested, and competent by outside coders analyzing the videotapes. One explanation for this rating is that there exists a widely held societal belief that pressuring students to achieve, providing highly structured support and evaluations of work, is a generally effective teaching technique and serves to enhance students' motivation and learning. This perception has received pop culture cred in Amy Chua's (2011) international best seller, *Battle Hymn of the Tiger Mother.*

So if being directive and controlling may not impede learning and might even enhance it, at least when coupled with a learning orientation, why then shouldn't we embrace that as our action theory? The answer is twofold. First, there are potential downsides to instruction that is controlling and that fosters student dependence. Second, I will argue that the idea of fostering student independence exists as an important, worthwhile goal in its own right.

Some potential downsides to student dependence are

- Deterioration of problem-solving strategies (Dweck & Leggett, 1988)
- A focus on extrinsic motivation
- Diminished enjoyment of learning
- Lack of resilience when faced with difficulties and challenges
- Decreased creativity and motivation (Koestner, Ryan, Bernieri, & Holt, 1984)

When we talk about student independence as a goal of education, it is useful to define what we mean. Rose-Duckworth and Ramer (2008) offer the following definition: "Independent learners are internally motivated to be reflective, resourceful, and effective as they strive to accomplish worthwhile endeavors when working in isolation or with others—even when challenges arise, they persevere" (p. 2). Certainly that definition embodies many qualities that parents and teachers alike wish to see students exhibit. Some additional benefits of independence as a goal include

- Resilience in the face of difficultly
- Openness and willingness to accept challenges
- Greater motivation, engagement, ownership, and "drive" (Pink, 2009)
- Intrinsic motivation
- Interdependence and independence
- Development of a learning or mastery orientation in oneself
- Enhanced self-esteem and sense of efficacy (Kostelnik, Whiren, Soderman, Stein, & Gregory, 2002)
- Development of lifelong learners

DEVELOPING A GROWTH VS. A FIXED MINDSET

The final belief set that exerts a profound impact on the culture of a classroom, organization, or group concerns how individuals view intelligence, ability, and talent. Specifically, it concerns what psychologist Carol Dweck refers to as one's "mindset" and

how that view shapes the way one approaches learning opportunities. Let's examine just what this mindset is, how it is developed, and how it ultimately shapes learning.

As a freshly minted researcher some thirty years ago, Dweck (2006) set out to try to understand how people cope with failure. In administering to subjects a series of increasingly challenging puzzle tasks that would ensure failure, Dweck thought she was investigating resilience in the face of adversity and how individuals cope with it. However, and to her amazement, she found that some of the individuals in the experiment didn't experience failure at all. It was not that they were successful in completing all of her puzzles—she had ensured that that would not happen—rather, it was that some people looked at the task as an opportunity to stretch their minds and learn to get better at solving puzzles. These individuals were energized by the challenge being presented and didn't register their incompletion of the task as a failure at all. What was going on?

Dweck has spent a career investigating just what was going on with these learners. In the process, she uncovered the power of one's beliefs about the nature of talent, ability, and intelligence to shape how one approaches challenges, deals with setbacks, and looks at opportunities. In study after study, Dweck has found that individuals who see talent, ability, and intelligence as fixed—that is, as something you either have or you don't—are much more likely to give up when they encounter difficulty and to judge their performance harshly. What is more, these same individuals actually shy away from opportunities to learn new things and develop their talents out of a fear that failure will expose them as not being as smart or talented as others might think they are. In contrast, her research has revealed that "in a growth mindset students understand that their talents and abilities can be developed through effort, good teaching and persistence. They don't necessarily think that everyone's the same or anyone can be Einstein, but they believe everyone can get smarter if they work at it" (Morehead, 2012).

In the summary of her research presented in the book *Mindset* (2006), Dweck shares how having a growth mindset allows athletes to bounce back from defeat and continue to develop their skills, CEOs to remain open to ideas and challenges from others, people in relationships to work through difficulties, artists to develop their talents, and so on. Regardless of the context, the thread running throughout these cases is a focus on ongoing growth and development through the situation and a lack of feeling threatened, beaten down, or counted out by difficulties and challenges. This facilitative approach to learning is markedly different from that of people who have a fixed mindset, who, by comparison, tend to gravitate toward situations that validate their perceptions of themselves and avoid those that will threaten it. But don't confuse a growth mindset with an overly optimistic view of the world or just telling yourself you can accomplish great things. Recent research on the brain demonstrates that the brain does in fact grow as a result of learning and that people really do get smarter and more skilled, and improve their natural talents as a result of their efforts. The growth mindset reflects the reality of learning.

Dweck has found in her surveys that roughly 80 percent of people can be classified as primarily one mindset or the other, with the numbers evenly split between the two mindsets. The remaining 20 percent cluster in the middle. A person's mindset can vary by context as well; for example, someone might see his artistic abilities as fixed but see his leadership abilities as continuously developing.

Mindsets are powerful shapers of our experience, but people aren't born with them. They develop through one's interactions with others, particularly in learning situations and in the feedback and input one receives in those situations. Our mindset develops through the subtle messages we encounter in classrooms and from teachers, mentors, and parents. To see how a belief in either a growth mindset or a fixed mindset can be shaped in a classroom, one need not look further than Dweck's personal experience growing up: "My 6th grade teacher seated us around the room in I.Q. order . . . , and although I did well in that metric it created this fear of falling from grace, of making the mistake of not being as perfect as I needed to be" (Morehead, 2012). Although the idea of seating by IQ might seem extreme, many schools today track or stream students by level or arrange seating clusters based on students' ability.

Teachers and parents also deliver implicit messages to learners about the nature of abilities through praise and feedback (Dweck, 2007). Comments like "You're so smart," "You're a really good reader," and "You're very talented," though intended to praise and motivate, send a message that one's abilities, such as they are, define you and that these are inherent in who you are as a person. If one accepts that one just is "a good reader," then one opens the door to also accepting that one "is just no good at math." In contrast, comments that focus on a person's efforts, something that is controllable, tend to aid in fostering a growth mindset: "You really worked hard at this, and it shows!" "That was really difficult, but you stuck to it and accomplished something." "I'm noticing that as you push yourself, your reading just keeps getting better and better."

It doesn't take much effort to envision how mindsets play out in the classroom, but what we may miss is the subtle ripple effects a mindset can have over the course of a student's education. Students with a fixed mindset may be more likely to shy away from challenges or may even refuse to have a go at new things. They may give up when they encounter difficulties, constantly ask for directions and reassurance to make sure they

won't make a mistake, or even blame the assignment (or the teacher) for being unfair and unreasonable when they get a bad grade. In longitudinal studies, Dweck discovered that students with a fixed mindset were more likely to fall apart, experience stress, and have difficulty when transitioning to more demanding environments, such as when moving from elementary to middle school.

When fixed-mindset students get back an assignment with a bad grade, they are likely to wad it up or stash it away in an effort to hide the evidence of failure. But the ramifications may go even further than that. In a large sample of middle school students, Dweck and her colleagues found that after receiving a poor score on a test, "students with a fixed mindset say yes, they would seriously consider cheating." Dweck provides evidence that the effects are not just cultural or generational: "A TV show in Korea recreated our praise studies and they showed that children and adults who were told they were brilliant before a task cheated substantially more than those praised for their process, for their effort" (Morehead, 2012). In some instances, the ripples of failure can extend further. After repeated failure and frustrations, some students with a fixed mindset will simply accept defeat and label themselves: "I'm just no good at math." "I can't draw." "I've never been able to do sports."

In contrast, those with a growth mindset, while not necessarily relishing bad news or bad grades on assignments, are unlikely to be defeated by them. These students will ask for clarification, suggestions, and feedback for the next time, seeing learning as a continuous process. In this way, growth-mindset students are more likely to focus on the learning over the work, framing challenges and questions as opportunities to learn and develop their understanding. In these behaviors, one can see that such students embody all the sets of expectations we have discussed: a learning orientation, a focus on understanding, depth of processing, and independence as a learner. Taken together, these five sets of beliefs lay a foundation for teachers' expectations in the classroom and form the basis for the action theories that will guide their instructional practice.

EXPLORING AND DEVELOPING EXPECTATIONS

- Evaluate the five belief sets. Each belief set exists as a natural tension for educators, meaning that although we might intellectually embrace the more facilitative end of each continuum, we might sometimes find an individual expectation hard to implement. Where are the tensions in each belief set for you? What conditions give rise to that tension? How do you resolve or lessen those tensions?
- Collect data on students' questions. Pay attention to the questions your students ask over the next week. Are they about learning or about the work? At the end of each class period, make a quick estimate of how many were work related and how many were about the learning and ideas being studied. What does this information reveal about how your students are approaching the lessons and class activities you have designed? How might you push students to be more focused on the learning?
- Focus on the learning. Talk with your students about the distinction between work and learning. Tell them that because your goal is always to focus on the learning, they should let you know if they aren't clear where the learning is in a given assignment. Make sure you introduce new assignments and tasks by highlighting their purpose and what you want students to learn. Pay attention to your own language and the use of the words "work" and "learning."
- Identify key understandings. Developing true understanding of anything is a complex, ongoing endeavor. If you could pick only three things that you want your students to understand after their year with you, what would they be? Why are those three things worth understanding? What future learning does understanding these three things enable?
- Analyze understanding experiences. Identify the one unit you teach that you feel does the best job of developing students' understanding. Analyze that unit to pinpoint the elements that helped build students' understanding. Look at that unit through the four elements of the Teaching for Understanding framework. Do those elements easily map on to your plans? How can you take "what works" from this unit and apply it to other units you teach?