FOCUSING STUDENTS ON THE LEARNING VS THE WORK

In work- oriented classrooms, 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