Putting Understanding Up Front

David Perkins and Tina Blythe

A simple four-part framework gives teachers a language and strategy for enhancing their efforts to teach for greater understanding.

In Braintree, Massachusetts, a mathematics teacher asks his students to design the floor plan of a community center, including dance areas and a place for a band. Why? Because the design involves several geometric shapes and a defined floor area. The students must use what they have studied about area to make an effective plan.

In Newton, Massachusetts, a literature teacher asks her students to reflect on and write about their own growing-up process. Why? Because the students will soon be reading *Their Eyes Were Watching God* (by Zora Neale Hurston) and focusing on the central character's development from child to adult.

In Sudbury, Massachusetts, science students prepare presentations that explain their position on whether or not the President should sign an international environmental protection treaty. Why? Because creating these statements engages students in applying and evaluating a number of scientific perspectives concerning global warming.

Anyone alert to current trends in teaching practice will not be surprised by such examples. They illustrate the committed effort to engage students more thoughtfully in subject-matter learning—drawing connections between students' lives and the subject matter, between principles and practice, between past and present.

Yet there is something different about the examples given—not what appears on the surface but what lies behind them. These three teachers created their plans with the help of a simple framework developed as part of an ongoing collaboration between teachers in the Boston area and researchers at the Harvard Graduate School of Education. Members of the Teaching for Understanding Project, a five-year effort funded by the Spencer Foundation, have investigated the nature of understanding, developed an approach to teaching for understanding, and tested it in a variety of classroom situations over the past four years. In collaborations with 60 middle and high school teachers, we learned much from meeting together, developing curriculum, conducting experiments, observing and talking with students, and writing case studies. The results of this work are summarized in this article and the five that follow.

We All Teach for Understanding, But…

Our early research was energized by the fact that most teachers could testify to the importance of teaching for understanding—and to the difficulty of the enterprise. Teachers were all too aware that their students often did not understand key concepts nearly as well as they might. Research affirms this perception. A number of studies have documented students' misconceptions about key ideas in mathematics and the sciences, their parochial views of history, their tendency to reduce complex literary works to stereotypes, and so on.

In response to these challenges, teachers look for ways to help their students develop better understandings. They strive to explain clearly. They look for opportunities to clarify. They often pose open-ended tasks such as planning an experiment or critiquing television commercials—tasks that call for and build understanding.

While these signs encouraged our work, we also became conscious of a paradox: Despite their attempts, teachers were still dissatisfied with students' understanding. And researchers were still finding rampant lack of understanding in students. Why the gap?

Several factors appear to be at work. First, our teacher-collaborators helped us to realize that teaching for understanding is only one of many agendas. Most teachers distribute their effort more or less evenly over that and a number of other objectives. Second, the schools in which teachers work and the tests for which they prepare their students usually offer little support for teaching for understanding. Third, questions of strategy arose: What curriculums, activities, and assessments would best support teaching for understanding day in and day out?

In addressing the first two factors, administrators and teachers need to weigh carefully the importance of teaching for understanding. We firmly believe that understanding deserves special attention. This does not mean that we deny the importance of other educational goals. For instance, a number of routine skills regarding arithmetic, spelling, and grammar certainly need development. But what use are students to make of the history or mathematics they have learned unless they have understood it? Among the many agendas of education, surely understanding must rank far up on the short list of high priorities.

As to the matter of strategy, we sought to develop a perspective that would help teachers to "put understanding up front." It would encourage them to give even more attention to understanding than they already do and help them with strategies for doing so.

What Is Understanding?

At the heart of teaching for understanding lies a very basic question: What is understanding? Good answers are not at all obvious. To draw a contrast, we all have a reasonable conception of what *knowing* is. When a student knows something, the student can bring it forth upon demand—tell us the knowledge or demonstrate the skill. Understanding is a subtler matter, which goes beyond knowing. But how?

To answer this question, we have formulated a view of understanding consonant with both common sense and a number of sources in contemporary cognitive science. Our "performance perspective," in brief, says that understanding is a matter of being able to do a variety of thought-demanding things with a topic—like explaining, finding evidence and examples, generalizing, applying, analogizing, and representing the topic in a new way.

For example, if a student "knows" Newtonian physics in the sense of being able to apply equations to routine textbook problems, we would not be convinced that the student really understands the theory. But suppose the student could find examples in everyday experience. (Why do football linemen need to be so big? So they will have high inertia.) Suppose the student could make predictions that would illustrate the theory. (Imagine a bunch of astronauts out in space having a snowball fight. What happens if they throw and get hit by snowballs?) The better the student could handle a variety of thought-demanding tasks concerning Newton's theory, the readier we would be to say that the student understood.

In summary, understanding is being able to carry out a variety of "performances" that show one's understanding of a topic and, at the same time, advance it. We call such performances "understanding performances" or "performances of understanding."

Is every student performance an "understanding performance"? By no means. While understanding performances can be immensely varied, by definition they have to take students beyond what they already know. Many performances are too routine to be understanding performances—true-and-false quizzes, standard arithmetic exercises, and so on. Such routine performances have their importance, too, but they do not build understanding.

How Can Students Learn for Understanding?

How do you learn to roller skate? Certainly not just by reading instructions and watching others, although these may help. Most centrally, you learn by skating. And, if you are a good learner, by *thoughtful* skating: you pay attention to what you are doing, capitalize on your strengths, and work on your weaknesses.

It's the same with understanding. If understanding a topic means building up performances of understanding around that topic, then the mainstay of learning for understanding must be actual engagement in those performances. The learners must spend the larger part of their time with activities that ask them to generalize, find new examples, carry out applications, and work through other understanding performances. And they must do these things in a thoughtful way, with appropriate feedback to help them to perform better.

This agenda becomes urgent when we think about how youngsters typically spend most of their classroom and homework time. Most school activities are *not* performances that demonstrate understanding: Rather, they build knowledge or routine skills. Moreover, when students do tackle understanding performances such as interpreting a poem or designing an experiment, they commonly

get little guidance about criteria, little feedback before the final product to help them make it better, and few occasions to reflect on their progress.

In summary, even though teachers are trying, typical classroom practice does not give a sufficient presence to thoughtful engagement in performances that show understanding. To get the understanding we want, we need to put understanding up front. And that means putting thoughtful engagement in understanding performances up front!

A Four-Part Framework

We have developed a framework that provides teachers with a language for planning and discussing their approach to a particular topic or an entire course. The framework highlights four key concepts.

1. *Generative topics.* Not all topics (concepts, themes, theories, historical periods, ideas, and so on) lend themselves equally to teaching for understanding. For instance, it is easier to teach statistics and probability for understanding than quadratic equations, because statistics and probability connect more readily to familiar contexts and other subject matters. It is easier to teach for understanding about the Boston Tea Party than about colonial tax policies, because the Boston Tea Party dramatizes issues around colonial tax policies. In general, we look for three features in a generative topic: centrality to the discipline, accessibility to students, and connectability to diverse topics inside and outside the discipline.

   Many teachers have emphasized that anything can be taught for understanding—even quadratic equations! It's just a matter of good teaching. We agree. But some topics are more central to the discipline, more accessible, and more connectable than others. These topics should form the core of the curriculum.

   However, many teachers feel restricted to established curriculum: particular topics must be taught, regardless of their generativity. One solution is to give a topic a more generative cast by adding a theme or a perspective—for example, teaching *Romeo and Juliet* as an exploration of the generation gap, or teaching about plants to illustrate that all living things are interconnected.

2. *Understanding goals.* The trouble with generative topics is that they are almost too generative. Each topic offers the opportunity to develop many different understandings. To create focus, teachers have found it useful to identify a few specific understanding goals for a topic. It has also proven helpful to list these goals in phrases of the form. "Students will understand that ..." or "Students will appreciate that...."

   Suppose that the topic is "The Boston Tea Party as Political Protest." One understanding goal might be: "Students will understand the features that make the Boston Tea Party like other political protests from various historical periods." Another might be: "Students will appreciate the state of mind incited by deprivation of civil rights." There is never a "right" list of understanding goals. The point is to lend focus to the ensuing instruction.

3. *Understanding performances.* We have already defined understanding performances and discussed their importance as the heart of developing understanding. Here we only add that teachers need to design understanding performances that support the understanding goals, and that students should be engaged in performances that demonstrate understanding from the beginning to the end of the unit or course. A classroom might devote

several weeks (or even months) to a generative topic. Throughout this time, students would engage in a variety of understanding performances (supported by appropriate information from texts and the teacher) on that topic and a few chosen goals. Successive understanding performances would present students with progressively more subtle but still accessible challenges. Ultimately, students might develop some "culminating" performance of understanding such as an extended essay or an exhibition.

4. *Ongoing assessment.* Traditionally, assessment comes at the end of a topic and focuses on grading and accountability. These are important functions in many contexts, but they do not serve students' learning needs. To learn for understanding, students need criteria, feedback, and opportunities for reflection from the beginning of and throughout any sequence of instruction. We call this process "ongoing assessment."

Occasions of assessment might involve feedback from the teacher, from peers, or from students' self-evaluation. Sometimes the teacher may give criteria, sometimes engage students in defining their own criteria. While there are many reasonable approaches to ongoing assessment, the constant factors are shared and public criteria, regular feedback, and frequent reflection throughout the learning process.

These four concepts delineate what we have found to be the core elements of instruction that put disciplinary understanding up front. Of course, they do not address every condition that affects student understanding. Other factors such as classroom structure and teacher-student relationships play important roles as well. The framework is meant only as a guide, which keeps the focus on understanding while allowing teachers room to design units and courses that suit their particular styles and priorities as practitioners in their disciplines.

What's New Here?

"Aren't we basically talking about good activities?" you might reasonably ask. We are indeed talking about teaching with good activities—good activities "plus." It is the "plus" that is the special contribution of this framework.

While teachers have always sought to teach with good activities, often those activities do not involve performances of understanding. For instance, a *Jeopardy*-style history quiz, an art activity of drawing the Boston Tea Party, a follow-the-recipe-style science experiment all can be engaging activities. But, typically, they do not press the learners to think well beyond what they already know. While some teachers often engage students in understanding performances, their curriculum may lack the focus provided by thinking in terms of carefully selected generative topics and goals for understanding. Or some students may not receive the ongoing assessment needed to help them learn from the performances of understanding.

Indeed, some of our most interesting work in developing this framework has been with teachers who already do much, or even most, of what the framework advocates. They tell us that the framework gives them a language and a philosophy. It helps them to sharpen the focus of their efforts. Frankly, we would be suspicious of the framework if the kind of teaching it advocated came as a surprise to most teachers. We hope instead that it will look familiar; "Yes, that's the kind of teaching I like to do—and sometimes, even often, *do* do." As emphasized earlier, teachers already strive to teach for understanding. So this performance view of teaching for understanding does not aim at radical, burn-the-bridges innovation. Its banner is not "completely new and wholly different" but a just-as-crucial "more and better."

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