Dimensions of Understanding: A Balanced View of Topics and Goals


The performance view of understanding says that students need to be able to use knowledge in novel contexts. The Dimensions of Understanding framework, developed during the Teaching for Understanding research project, helps us focus on doing that. It names four general categories (or "dimensions") that contribute to complete understanding of a topic from a disciplinary perspective: purposes for using the topic, methods for finding out about it, forms of expressing and communicating the topic, and knowledge about the topic. These dimensions help teachers think about both Generative Topics (especially the "central to the discipline" criterion) and about Understanding Goals (in which we specify what's important to understand about the topic in a given unit of instruction). Once you've created a set of Understanding Goals (as you did last session), you can check them over to see if they point students toward a complete and balanced understanding of the topic. The dimensions help teachers explore the full breadth of ways in which "knowledge can be applied in novel contexts."

Purposes: Why do experts care about this topic? (why)

This question relates to the dimension we call purposes. People who are expert in a topic use knowledge about it for many different reasons. They explain phenomena, interpret it, persuade others with it, provoke discussion, solve problems with it, and appreciate it. Many times, students don't know what the knowledge they're learning is for – who hasn't dreaded that little voice from the corner of the room saying, "Why do we have to do this?" We ought to be able to answer. We want students to understand what their learning is for. Understanding includes recognizing how knowledge is used and using it in different ways, at least some of which are personally meaningful. When you're reviewing your understanding goals, check to see if any of them incline students toward understanding what the topic is good for, why experts care, and why the students might care, too.

Methods: How do experts find out? (how)

This question focuses on the second dimension of understanding, methods. But don't be misled – we're not talking about teaching or pedagogical methods. We're talking about disciplinary methods – that is, about the approaches that experts use to find out about topics and determine the quality and trustworthiness of information. Methods are processes, skills, or strategies for finding, building, and judging the worth of information. Examples include comparing and contrasting, generalizing, estimating, or predicting. Methods are active verbs that require thinking. Teachers often want students to understand standard methods that experts use when they study a topic – like hypothesizing and experimenting, or gathering, recording, and organizing data, or guessing and checking, or revising and editing – the list goes on and on. So, when you're thinking about your understanding goals, check to see if you've focused students' attention on any important disciplinary methods – you might well want to.

Forms: Where do experts share what they know? (where)

This question brings attention to the dimension forms. Experts create knowledge by thinking and acting, and that knowledge shows in the forms of expression typical of that discipline. Forms are nouns – when a method is carried out, it shows up in a form that we can see. Forms make disciplinary processes visible. Concepts about topics are communicated through a range of symbol systems and genres. For example, knowledge of biology can be communicated through reports, equations, diagrams, illustrations, charts, and casual conversations, among other ways. Literature scholars express meaning in novels, short stories, poetry, speeches, articles, readings, book groups, dialogues, and plays (all genres), and in
words, metaphors, sentences, paragraphs, chapters, and illustrations (symbol systems).
Depending on who the audience is, one might use varied forms (e.g., a picture book on ants for preschoolers, a journal article for scientists). Students need to understand proto-typical disciplinary forms. So, when you're looking at your understanding goals, check to see if there are any that help students consider disciplinary repositories of information and concepts:
forms. Where does knowledge about that topic show?

**Knowledge: What is this topic about? (what)**

This question focuses on the dimension of understanding we call *knowledge*. It's not very controversial – most people would agree that understanding requires knowing. The trick is that the knowing is not a one-legged horse – a topic can only take you someplace when it runs with all four of its legs (methods, forms, purposes, and knowledge). Disciplinarians work within rich, connected, organized networks or webs of information and concepts when they consider important topics. Teachers want students to reconstruct whatever naive understanding they bring to any topic -- what Howard Gardner has called their "unschooled minds" -- by building such networks of information to include lots of concepts and facts that are organized into clear systems of connections. Having such networks allows flexible use of the ideas that comprise a topic -- you can enter the web anywhere and go off in a host of logical directions from that point. So, teachers can think about which knowledge networks within a topic are critical for the students they're teaching and aim an understanding goal or two at those concepts.