

## Chapter One

# Standards for Authentic Achievement and Pedagogy

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The search to determine whether school restructuring leads to high-quality teaching and learning must begin by identifying standards. Different kinds of standards have been advanced for judging what teachers and students do; some address knowledge and skills, and others focus on the process of teaching. Good teaching has been defined in various ways, such as modeling direct instruction, in which teachers exercise very precise control over student activity and dialogue, or having students engage in active learning, in which students exert more initiative in planning and conducting their studies. Student achievement has been defined as knowing correct answers, using a proper written form, or working cooperatively in a group. For this study, we decided that standards for success should focus on the intellectual quality of teachers' and students' work and developed criteria to measure intellectual quality regardless of the particular form of instruction observed or the specific student outcome produced. We acknowledge persuasive arguments that educational goals should extend beyond intellectual development (for example, to include internalization of moral-social values or the nurturing of specific kinds of socially responsible and economically productive behavior). Recognizing the importance of other goals, we nevertheless chose to focus this study on how the restructuring of schools might enhance the intellectual quality of academic work. Although there is much rhetoric endorsing cognitive development, it is often neglected in schools and in reform programs.

Initially we developed intellectual standards for pedagogy and achievement only as a research tool to study the effects of school restructuring. We did not describe them in any detail to teachers participating in the research or try to influence their instruction and assessment to be consistent with them. But the results and reactions to the standards from a variety of practicing educators after data collection was completed suggest they can also be used to guide school reform to help teachers improve student learning. We therefore explain the standards in some detail.

First, we developed a vision or definition of high-quality intellectual achievement. Called *authentic achievement*, it depends on three main criteria: construction of knowledge, disciplined inquiry, and value of learning beyond school. We examine these below.

Next, we translated these general criteria into more specific standards for evaluating teaching. Teaching consists of two primary functions: daily instruction and assessing student performance. How teachers conduct these functions is critical to student learning. Accordingly we developed four standards for teachers' instruction and seven standards for their assessment tasks. Together these standards for instruction and assessment constitute our definition of authentic pedagogy. At each of the twenty-four schools, we observed a sample of teachers four times and collected at least two assessment tasks from them. The standards were developed into sets of scoring rules, or "rubrics" (scaled from 1 to 5) that researchers used to rate the intellectual quality of the observed pedagogy in mathematics and social studies classes.

Finally, continuing to build on the vision of authentic achievement, we translated the criteria of construction of knowledge and disciplined inquiry into three standards for scoring the quality of student performance. Each of these standards was translated into scoring rubrics (scaled from 1 to 4). Experienced teachers in mathematics and social studies used the standards to score more than four thousand pieces of student written work completed in response to the assessment task teachers submitted.<sup>1</sup>

### **Vision: Authentic Achievement**

The term *authentic* commonly refers to something that is real, genuine, or true rather than artificial, fake, or misleading. How does

this distinction apply to intellectual work in school? The kind of achievement required for students to earn school credits, grades, and high scores on tests is often considered trivial, contrived, and meaningless by both students and adults, and the absence of meaning breeds low student engagement in school work. Meaningless school work is a consequence of a number of factors but especially curriculum that emphasizes superficial exposure to hundreds of isolated pieces of knowledge. Such exposure is reinforced by teacher training institutions, textbook publishers, testing agencies, and universities. Teaching loads and school schedules also make it difficult for teachers to help individual students delve deeply into knowledge to understand its importance. In addition, schools isolate students from adults in the community, making it difficult for young people to understand the ways in which intellectual work can produce significant achievements. Authentic achievement can suggest standards for intellectual accomplishment and goals for schooling that would reduce these misuses of the intellect.

But what qualities are critical to authentic intellectual work? Consider the important adult task of designing a bridge. Typically a bridge requires both new and well-established knowledge in the fields of design and construction. Disciplines of engineering, architecture, science, and mathematics have accumulated bodies of reliable knowledge and procedures for solving the more routine problems of bridge design, but unique problems will require new conceptions of design and construction. New, unique knowledge is produced as special conditions are addressed involving the bridge's particular length, height, and peak points of stress and load but also the impact of possible environmental conditions involving weather extremes of temperature, wind, ice, snow, and floods, as well as the possibility of earthquakes. When completed, the bridge will prove safe and useful to travelers, it may make an aesthetic statement, and it will likely be considered a personally satisfying accomplishment to those who designed it. Successful completion of building the bridge illustrates some essential intellectual qualities of authentic achievement.

The term *authentic achievement* thus stands for intellectual accomplishments that are worthwhile, significant, and meaningful, such as those undertaken by successful adults: scientists, musicians, business entrepreneurs, politicians, crafts people, attorneys,

novelists, physicians, designers, and so on. With children we are concerned with a more restricted conception of achievement, one that can be accomplished in schools. For students, we define authentic academic achievement through three criteria critical to significant intellectual accomplishment: construction of knowledge, disciplined inquiry, and the value of achievement beyond school.<sup>2</sup>

### Construction of Knowledge

Adults in diverse fields of endeavor face the primary challenge of constructing or producing, rather than reproducing, meaning or knowledge. They express this knowledge in written and oral discourse (using words and other symbols), by making and repairing things (furniture, bridges, videos, sculpture), and in performances for audiences (musical, dramatic, athletic).

To help children eventually to attain the competence of skilled adults, schools should engage students in the general forms of cognitive work found in the adult world. That is, students should hone their skills and knowledge through guided practice in producing original conversation and writing, repairing and building of physical objects, or performing artistically. In contrast, the conventional curriculum asks students mainly to identify definitions, things, and performances that others have produced (for example, by recognizing the difference between socialism and capitalism, by matching authors with their works, or by correctly labeling rocks or parts of a flower).

For high-quality achievement, student construction of knowledge must be based on a foundation of prior knowledge. That is, students must assimilate a great deal of knowledge that others have produced. But the mere reproduction of that prior knowledge does not constitute authentic achievement, because it does not involve the construction of knowledge found in significant intellectual accomplishment.

### Disciplined Inquiry

The second defining feature of authentic achievement is its reliance on cognitive work that involves disciplined inquiry. Disciplined inquiry consists of three main features: (1) use of a prior

knowledge base, (2) striving for in-depth understanding rather than superficial awareness, and (3) expressing one's ideas and findings through elaborated communication. We think all students are capable of engaging in these forms of cognitive work when the work is adapted to students' levels of development.

A broad definition of human achievement might not always illustrate disciplined inquiry as suggested by academic study (Gardner, 1983, 1993). For example, feats of wilderness survival that depend largely on ingenuity and courage, forms of athletic prowess, and selfless acts of caring and personal sacrifice might all be considered authentic, but they may not illustrate much disciplined inquiry. Since schooling, at a minimum, should promote academic study, our conception of human accomplishment is intentionally limited to achievements that depend on the use of formal knowledge.

#### *Prior Knowledge Base*

Human accomplishments build on prior knowledge that has been accumulated in a field. The knowledge base includes facts, vocabularies, concepts, theories, algorithms, and conventions for the conduct and expression of inquiry itself. The ultimate point of disciplined inquiry is to move beyond such knowledge through criticism, testing, and development of new paradigms. Most cognitive work in school, however, consists of transmitting prior knowledge to students and asking them to accept it, reproduce it in fragmented statements, or recognize it on tests. Only rarely are students asked to use what they have learned to construct new knowledge.

#### *In-Depth Understanding*

Disciplined inquiry seeks to develop an in-depth understanding of a problem rather than only a passing familiarity with it or exposure to pieces of knowledge. Prior knowledge is mastered primarily not to become literate about a broad survey of topics but to facilitate complex understanding of discrete problems. In-depth understanding requires more than knowing a lot of details about a topic. It occurs as one looks for, tests, and creates relationships among pieces of knowledge that can illuminate a particular problem or issue. In short, in-depth understanding involves construction of

knowledge around a reasonably focused topic. In contrast, many of the cognitive tasks of school ask students to show only superficial awareness of a vast number of topics.

### *Elaborated Communication*

Scientists, jurists, artists, journalists, designers, engineers, and other accomplished adults working within disciplines rely on complex forms of communication both to conduct their work and to express their conclusions. The language they use—verbal, symbolic, and visual—includes qualifications, nuances, elaborations, details, and analogues woven into extended expositions, narratives, explanations, justifications, and dialogue. In contrast, much of the communication demanded in school asks only for brief responses: choosing true or false, selecting from multiple choices, filling in blanks, or writing short sentences. If students learn to communicate in elaborate forms, they will be better able to construct knowledge, achieve in-depth understanding, and express their intellectual accomplishment more effectively.

### Value Beyond School

The third criterion reflects aesthetic, utilitarian, or personal value evident in significant intellectual accomplishments. In contrast, most conventional school achievement is designed only to document the competence of the learner. When adults write (letters, news articles, poems), speak a foreign language, design a house, create a painting or a piece of music, or build a stereo cabinet, they try to communicate ideas, produce a product, or have an impact on others beyond the simple demonstration that they are competent. Achievements of this sort have a value that is missing in tasks contrived only for the purpose of assessing knowledge (such as spelling quizzes, laboratory exercises, or typical final exams). The call for relevant or student-centered curriculum is, in many cases, a less precise expression of the view that student accomplishments should have value beyond being only indicators of success in school. Some people may want to reserve the term *authentic* for curriculum that is relevant, student centered, or hands-on, but we do not. Value beyond the school is only one criterion for authentic intellectual work.

These three criteria—construction of knowledge, through disciplined inquiry, to produce discourse, products, and performances that have meaning beyond success in school—form the foundation for standards to assess the intellectual quality of teaching and learning. All three criteria are important. For example, students might confront a complex calculus problem demanding much analytical thought (construction of knowledge and disciplined inquiry), but if its solution has no interest or value beyond proving competence to pass a course, its authenticity is diminished. Or a student may write a letter to the editor, saying she opposes a newly proposed welfare plan. This activity may meet the criterion of constructing knowledge to produce discourse with value beyond school, but if the letter shows only shallow understanding of the issues or contains significant errors of fact, it would be less authentic because of shortcomings in disciplined inquiry.

Authentic achievement is demanding in its insistence on all three criteria, but a given achievement in a school could be high on some criteria and lower on others. Similarly we do not expect all classroom activities to meet all three standards all of the time. For example, repetitive practice, retrieving information, and memorization of facts or rules may be necessary to build knowledge and skills as foundations for authentic performance, or to prepare for unauthentic tests required for advancement in the current educational system. The point is not to abandon all forms of unauthentic work in school, but to keep authentic achievement clearly in view as the ideal valued end.

Two points should convince educators to strive for authentic student achievement. First, participation in authentic intellectual activity is more likely to motivate and sustain students in the hard work that learning requires. Evidence from our study supports the connection between authentic pedagogy and student effort and interest in learning (Marks, 1995). Students exposed to authentic pedagogy may have been more engaged because their intellectual work had personal meaning beyond the demonstration of competence to a teacher.

Second, teaching students to master authentic academic challenges should benefit both individuals and the society. The complexities of contemporary society demand that citizens be problem solvers and lifelong learners capable of adapting to

changing economic and social conditions. Whether trying to make a living, manage personal affairs, or participate in civic life, citizens are increasingly called on to exercise the kinds of intellectual capacities reflected in authentic achievement. Schools that fail to help students face these challenges deny them opportunities for security, productivity, and fulfillment.

### **Authentic Pedagogy: Assessment Tasks**

Tests and other assignments used to evaluate performance communicate to students the kind of intellectual work that is valued. We asked teachers to send examples of their assessment tasks—ones that helped them determine how well their students were understanding and mastering the subject taught. We asked for tasks that called on students to respond with written work because, at the very least, we believe that all students should learn to write well in both mathematics and social studies.<sup>3</sup> Teachers provided tasks that asked students to write opinion essays, explain solutions to mathematics problems, synthesize research data, draw maps and mathematical diagrams, and complete short-answer tests.

We developed seven standards for assessment tasks that reflect the three criteria for authentic achievement. They are listed in Exhibit 1.1.

### **Applying the Standards for Construction of Knowledge**

If students are to succeed in constructing knowledge, the assessment activities they complete must call on them to organize information and consider alternatives. In mathematics, for example, fourth- and fifth-grade students were given the following task involving measurement, fractions, and fraction computation:

We are making a wooden case to hold our new CD system. We need to have 3 shelves. The top shelf must contain 3 compartments; the second shelf, 2 compartments; and the bottom shelf, 1 compartment. We also have 6 boards that are 60 inches long, 2.5 feet wide, and 1 inch thick. Draw a diagram of what the shelves will look like when finished. Using fractions, show how you will cut the boards to make compartments.

### **Exhibit 1.1. Standards for Authentic Pedagogy: Assessment Tasks.**

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#### *Construction of Knowledge*

*Standard 1: Organization of Information.* The task asks students to organize, synthesize, interpret, explain, or evaluate complex information in addressing a concept, problem, or issue.

*Standard 2: Consideration of Alternatives.* The task asks students to consider alternative solutions, strategies, perspectives, or points of view in addressing a concept, problem, or issue.

#### *Disciplined Inquiry*

*Standard 3: Disciplinary Content.* The task asks students to show understanding and/or to use ideas, theories, or perspectives considered central to an academic or professional discipline.

*Standard 4: Disciplinary Process.* The task asks students to use methods of inquiry, research, or communication characteristic of an academic or professional discipline.

*Standard 5: Elaborated Written Communication.* The task asks students to elaborate on their understanding, explanations, or conclusions through extended writing.

#### *Value Beyond School*

*Standard 6: Problem Connected to the World Beyond the Classroom.* The task asks students to address a concept, problem, or issue that is similar to one that they have encountered or are likely to encounter in life beyond the classroom.

*Standard 7: Audience Beyond the School.* The task asks students to communicate their knowledge, present a product or performance, or take some action for an audience beyond the teacher, classroom, and school building.

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