A HANDBOOK FOR the Art and Science of Teaching

Robert J. Marzano
John L. Brown

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To my lifelong friends and colleagues Debra Pickering and Diane Paynter, who have taught me a great deal about effective teaching.

Robert J. Marzano

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John L. Brown

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Module 1

Introduction

The Art and Science of Teaching (Marzano, 2007) was designed as a comprehensive framework for effective instruction to be used by teachers in every subject area at every grade level. As such, it is an update and amalgamation of previous works such as *Classroom Instruction That Works* (Marzano, Pickering, & Pollock, 2001), *Classroom Management That Works* (Marzano, Pickering, & Marzano, 2003), and *Classroom Assessment and Grading That Work* (Marzano, 2006). Given the complexity of teaching, it makes sense that a comprehensive framework would necessarily include and integrate other works that address specific aspects of teaching.

The title words *art* and *science* were carefully selected to convey a message—effective teaching is both art and science. It is art in the sense that it involves no specific script all effective teachers must follow. Indeed, effective teachers are as varied in their characteristics and behaviors as are effective students. It is science in the sense that there are strategies that research over time has shown to have a high probability of enhancing student achievement. These "high probability" strategies are the tools in an effective teacher's tool box. Not every teacher uses these tools in the same way and with the same frequency. However, most effective teachers probably have developed a facility with them.

In keeping with the variety and flexibility that characterize the domain of effective teaching, *The Art and Science of Teaching* is presented as a series of design questions (see Figure 1.1). These questions are used by teachers as reminders of what should be addressed during a unit of instruction and the lessons within those units. Again, different teachers will answer these questions in different ways with comparable results.

FIGURE 1.1

Design Questions for *The Art and Science of Teaching*

1. What will I do to establish and communicate learning goals, track student progress, and celebrate success?
2. What will I do to help students effectively interact with new knowledge?
3. What will I do to help students practice and deepen their understanding of new knowledge?
4. What will I do to help students generate and test hypotheses about new knowledge?
5. What will I do to engage students?
6. What will I do to establish or maintain classroom rules and procedures?
7. What will I do to recognize and acknowledge adherence and lack of adherence to classroom rules and procedures?
8. What will I do to establish and maintain effective relationships with students?
9. What will I do to communicate high expectations for all students?
10. What will I do to develop effective lessons organized into a cohesive unit?

The Structure of the Handbook

This handbook is organized into modules. There are two or more modules for each of the 10 design questions. Figure 1.2 lists the modules that relate to each design question. Each module begins with a section titled Reflecting on Your Current Beliefs and Practices. This section is intended as a set of preview questions that not only stimulate your background knowledge regarding the content in the module but also provide a framework for digesting the information in the module. Each module ends with a section titled Checking for Understanding. This section provides a brief summary of the module content in the context of self-assessment questions that ask you to consider what you understood well and what might require some reexamination on your part.

FIGURE 1.2

Design Questions and Modules

Design Question 1: What Will I Do to Establish and Communicate Learning Goals, Track Student Progress, and Celebrate Success?

- Module 2: Establishing and Communicating Learning Goals
- Module 3: Designing and Using Formative Assessments

Design Question 2: What Will I Do to Help Students Effectively Interact with New Knowledge?

- Module 4: Identifying Critical-Input Experiences and Using Previewing Strategies

- Module 5: Using Cooperative Learning, Curriculum Chunking, and Descriptions, Discussions, and Predictions
- Module 6: Helping Students Elaborate on New Content, Summarize and Represent Their Learning, and Reflect on Their Learning

Design Question 3: What Will I Do to Help Students Practice and Deepen Their Understanding of New Knowledge?

- Module 7: Examining Similarities and Differences and Identifying Errors in Thinking
- Module 8: Helping Students Practice Skills, Strategies, and Processes
- Module 9: Using Homework and Academic Notebooks to Deepen Student Understanding

Design Question 4: What Will I Do to Help Students Generate and Test Hypotheses About New Knowledge?

- Module 10: Teaching Students to Support Claims and Assertions with Evidence
- Module 11: Hypothesis Testing and Higher-Order Thinking
- Module 12: Engaging Students in Task Design, Cooperative Learning, and Self-Evaluation

Design Question 5: What Will I Do to Engage Students?

- Module 13: Using Games and Inconsequential Competition to Promote Student Engagement
- Module 14: Rules of Engagement: Questioning, Physical Movement, and Pacing
- Module 15: Additional Cognitive, Affective, and Social Interaction Strategies for Promoting Student Engagement

Design Question 6: What Will I Do to Establish or Maintain Classroom Rules and Procedures?

- Module 16: Effective Classroom Organization
- Module 17: Establishing and Maintaining Classroom Rules and Procedures

Design Question 7: What Will I Do to Recognize and Acknowledge Adherence and Lack of Adherence to Classroom Rules and Procedures?

- Module 18: Acknowledging Students' Adherence to Classroom Rules and Procedures
- Module 19: Acknowledging Students' Lack of Adherence to Classroom Rules and Procedures

Design Question 8: What Will I Do to Establish and Maintain Effective Relationships with Students?

- Module 20: Communicating Appropriate Levels of Concern and Cooperation
- Module 21: Communicating Appropriate Levels of Guidance and Control

Design Question 9: What Will I Do to Communicate High Expectations for All Students?

- Module 22: Identifying High-Expectancy and Low-Expectancy Students
- Module 23: Changing Behavior Toward Low-Expectancy Students

Design Question 10: What Will I Do to Develop Effective Lessons Organized into a Cohesive Unit?

- Module 24: Identifying the Focus of a Unit
- Module 25: Developing Effective Lessons

Each module presents information in small, digestible bites or "chunks." This is in keeping with a basic principle of effective teaching discussed in Design Question 2: *What will I do to help students effectively interact with new knowledge?* After each chunk of information, you will find an activity box that asks you to react to the information that has

been presented or to describe how you might use that information. To illustrate, consider Figure 1.3, which is one of the activity boxes from Module 5: Using Cooperative Learning, Curriculum Chunking, and Descriptions, Discussions, and Predictions. This module is one of three within Design Question 2.

FIGURE 1.3

Sample Activity Box from Module 5

Activity Box

The examples in this section demonstrate two different types of "chunking." The first example demonstrates how a teacher might chunk the content during a single lesson—a small piece (i.e., a chunk) of information is presented to students, which they then process in small groups. The next two examples illustrate a second approach to chunking. Here new information is organized into chunks across different lessons during a unit. It is important to note that during these lessons information would also be chunked into small digestible bites. Describe how you have used or could use each of these two approaches to chunking.

How to Use the Handbook

This handbook is intended as a self-study guide for the 10 design questions underlying *The Art and Science of Teaching*. Although it is possible to use this handbook without having first read the book, we strongly recommend that you do so, particularly if you are interested in the research and theory that form the foundation for the recommendations in this handbook.

One way to use the handbook is to read it independently. In doing so, the design questions can be addressed out of order but will be more fluid if read in order. Another useful approach is to form study teams. We believe this is the most effective way to study the specifics of the design questions in *The Art and Science of Teachin*g because it allows colleagues to compare perspectives. These study teams might be impromptu groups, grade-level groups, departmental groups, or an entire faculty. To stimulate dialogue we recommend that each participating member of a study team independently complete the activity boxes within a module. The team can then compare answers to these queries. In short, the activity boxes within each module can serve as the basis for an analytic discussion by colleagues of each module's content.

Regardless of how the handbook is used, a careful reading of it along with a reading of *The Art and Science of Teaching* should provide you with a thorough grounding in the strategies identified by the science of teaching as highly likely to enhance student achievement. Using these strategies in a way that enhances the achievement of your particular

students is the domain of the art of teaching that must be thought of as a personal journey of reflective practice over a number of years. We hope this handbook will serve as a road map on that journey.