

Preface

In this book, we present and discuss a framework for orchestrating mathematically productive discussions that are rooted in student thinking. The framework identifies a set of instructional practices that will help teachers achieve high-demand learning objectives by using the work and thinking of students as the launching point for discussions in which important mathematical ideas are brought to the surface, contradictions are exposed, and understandings are developed or consolidated. The premise underlying the book is that the identification and use of a codified set of practices can make student-centered approaches to mathematics instruction accessible to and manageable for more teachers. By giving teachers a road map of things that they can do in advance and during whole-class discussions, these practices have the potential for helping teachers to more effectively orchestrate discussions that are responsive to both students and the discipline.

Throughout the book, we illustrate each of the practices, drawing on our experiences in classrooms with which we have become acquainted through research or professional practice (e.g., through teachers with whom we have worked in professional development initiatives). In particular, we make significant use of two classroom lessons: the Case of Darcy Dunn and the Case of Nick Bannister. The Case of Darcy Dunn is introduced in chapter 3 as a vehicle for investigating the five practices in action, and it is revisited in subsequent chapters as the practices are explored more fully. The Case of Nick Bannister is explored in considerable depth in chapters 4 and 5 as each of the five practices is examined in detail, and then it is referred to again in subsequent chapters as broader issues are considered.

Following research that has established the importance of learners' construction of their own knowledge (Bransford, Brown, and Cocking 2000), we have designed this book to encourage the active engagement of readers. In several places throughout the book, in notes titled "Active Engagement," we suggest ways in which the reader can engage with specific artifacts of classroom practice (e.g., narrative cases of classroom instruction, transcripts of classroom interactions, instructional tasks, samples of student work). Rather than passively read the book from cover to cover, readers are encouraged to take our suggestions to heart and pause for a moment to grapple with the information in the ways suggested. By actively processing the information, readers' understandings will be deepened, as will their ability to access and use the knowledge flexibly in their own professional life. In addition, at the end of chapters 4, 5, 6, and 7, we have provided suggestions (titled "*Try This!*") regarding how a teacher can explore the ideas from the chapter in his or her own classroom.

Although the primary focus of the book is the five practices model (chapters 1, 3, 4, and 5), it also explores other issues that support teachers' ability to orchestrate productive classroom discussions. Specifically, chapter 2 emphasizes the need to set clear goals for what students will learn as a result of instruction and to identify a mathematical task that is consistent with those learning goals prior to engaging in the five practices. Chapter 6 focuses explicitly on the types of questions that teachers can ask to challenge students' thinking and the moves that teachers can make to promote the participation of students in whole-class discussions. Chapter 7 situates the five practices model for facilitating a discussion within the broader context of preparing for a lesson and introduces a tool for comprehensive lesson planning in which the five practices are embedded. Chapter 8 discusses ways in which teachers can work with colleagues, coaches, and school leaders to ensure that they have the time, materials, and access to expertise that they need to learn to orchestrate productive discussions. The book concludes with chapter 9, which is a discussion of the lessons learned from and benefits of using the five practices model.

The book also includes a set of appendices that provide additional resources, including a list of task and lesson resources, a sample lesson plan, and a monitoring chart, and a professional development guide that offers guidance in designing learning opportunities for teachers around the five practices. Finally, we have made a set of resources, most notably templates for lesson planning and monitoring, available at more4U.