

Chapter 1

Introduction

In the spring of 1998, the California Department of Education (CDE) awarded a contract to WestEd, in partnership with the RAND Corporation and Management Analysis and Planning, Inc. (MAP), to study mathematics instruction in California. The study was designed to examine the instructional practices used in teaching mathematics in grades 4 and 8 and the influence of policy on instruction. The findings of the study, which was conducted from June 1998 through June 2000, are reported in this document. Implications for policy are presented as well.

The study focused on the following major research questions:

What classroom instructional practices and materials and what staff development are associated with higher mathematics achievement?

To what extent are the instructional practices and characteristics that are identified in high performing classrooms prevalent throughout the state?

What influence do state and local policies have on instructional practices? (e.g., policies relating to materials adoption, standards, assessment, etc.)

The original Request for Proposal (RFP) issued by CDE called for a highly comprehensive study at grades 2, 4, 8, and 10 with methods similar to those used in the Third International Mathematics and Science Study (TIMSS). However, the limited resources available necessitated a study somewhat more limited in scope and in the methods used. A detailed discussion of the employed methodology is provided in the following chapter. Key elements were a survey of 800 teachers about their instructional practices, a statistical analysis linking the survey responses with the mathematics achievement data of the responding teachers' students, and observations and interviews with 55 of the surveyed teachers. The study focused on grades 4 and 8 in 11 California school districts.

The RFP also discussed the importance of collecting baseline data about teachers' practices and the influences upon them prior to the emergence of new policies affecting mathematics education. However, several of these new policies were adopted prior to the study's main data collection activities, complicating the effort to establish a baseline. In fact, the study found that many teachers reported greater familiarity with the new policies—such as the California Mathematics Content Standards adopted by the State Board of Education in 1997 and the 1998 California Mathematics Framework—than with earlier policies and documents, such as the 1992 Framework. (Teachers' familiarity with these documents, and

the extent to which the documents have influenced instruction, is further discussed in Chapter 5, “Content Standards.”) The flux in policy—and the simultaneous existence of policies that sometimes appear contradictory—not only complicates research efforts, but also creates challenges for teachers, as this report reveals.

Subsequent chapters of this report are as follows:

Chapter 2, Methodology: Describes the study’s research methodology and data collection instruments.

Chapter 3, Instructional Practices and Effectiveness: Presents and discusses quantitative and qualitative study findings on correlations between instructional practices and student achievement.

Chapter 4, Curriculum Materials: Presents study findings on the extent to which district-adopted curriculum materials are used by teachers and discusses teachers’ concerns about instructional materials.

Chapter 5, Content Standards: Presents and discusses study findings on teachers’ reactions to and familiarity with various standards documents, the impact of standards on instruction, and the alignment of standards with curriculum.

Chapter 6, Assessment: Presents and discusses study findings on the impact of the Stanford Achievement Test, Ninth Edition, Form T (SAT-9) and on perceived problems with this and other assessments.

Chapter 7, Professional Development: Presents and discusses study findings on the amount of professional development teachers reported having received since January 1998, the ways in which teachers report that professional development enhances their instruction, and the challenges of providing effective professional development on a wide-scale basis.

Chapter 8, Structural and Student Influences on Instruction: Presents and discusses study findings on the influences on instruction that are structural, such as those relating to time and class size, and that are student-related, such as those concerning student preparation, skill level, behavior, and motivation.

Chapter 9, Recommendations and Conclusions: Summarizes the study’s primary findings in relation to the research questions, discusses policy implications, and presents recommendations based on the findings and implications.

To assist the reader, chapters 3 through 8 each begin with a box highlighting primary findings, followed by a section providing the recent historical background and policy context for the topics discussed in the chapter.