

## Preface

Technology is playing an increasingly important role in the teaching and learning of mathematics at all levels. As indicated in the NCTM *Principles and Standards for School Mathematics* and as stated in the NCTM position paper entitled “The Use of Technology in the Learning and Teaching of Mathematics,” “Technology is an essential tool for teaching and learning mathematics effectively; it extends the mathematics that can be taught and enhances students’ learning.” Page 1 of this yearbook contains the full text of the NCTM position paper. The term *technology*, as used in this yearbook, refers to all forms of electronic devices, including computers, calculators and other handheld devices, telecommunications equipment, and the multitude of multimedia hardware, including the software applications associated with their use. These devices and related applications continue to be less and less distinguishable in both form and function, as does one’s ability to categorize them and their appropriate use in the teaching and learning process.

To foster the establishment or improvement of technology-supported mathematics learning environments, Part 1: How Research Informs (articles 1–8) reports on overviews of research and findings on the impact of technology on the learning and teaching of mathematics, K–16. These research findings should help guide instruction and assessment decisions made by teachers.

As the twenty-first century unfolds, technology is becoming more visible in mathematics classrooms. Teachers are feeling its impact as they try to capture the vision of NCTM’s Technology Principle in their classrooms. But finding effective ways to use technology for teaching, learning, and assessing mathematics can still be a daunting task. The articles in Part 2: Notes from the Field (articles 9–22) are intended to furnish a rich context in which to observe teachers in prekindergarten through grade 12 and teacher educators using technology to help their students better understand mathematics. From its opening paper, which addresses the reality of using technology in the classroom, to its concluding article, which showcases how GIS technology can be used to transform the mathematical landscape, this section offers insight for mathematics educators to use both established and emerging technologies to effectively enhance the teaching and learning of mathematics.

The concluding section of this yearbook, Part 3: Questions about the Future (article 23), gives us all a glimpse of what the future might hold in store for us. In “Technology in Mathematics Education: Tapping into Visions of the Future,” the author seeks answers to the following questions: What will technology look like in mathematics classrooms ten years from now? How will technologies be used to affect school mathematics content and teaching? What are the principal changes in mathematics teaching and learning that we

might expect over the next decade? The goal of this final article is to look forward to what technology-supported mathematics learning environments might look like in the future. To find answers to this question, the author interviewed twenty-two individuals, all of whom are noted for leading-edge thinking on the uses of technology, most of them in the use of technology in the teaching and learning of mathematics.

This yearbook consists of two separate but closely related pieces: the printed yearbook and an accompanying CD. The CD includes electronic features that enhance an understanding of the articles presented in the printed yearbook. URLs indicated in the hardcopy can be found in click-on Web-accessible format on the CD, as can files illustrating the software used in the articles themselves. Web access to trial versions of the software considered in the printed yearbook is also available directly from the CD. Worksheets and other related material are included, as appropriate. Articles 2, 9, 15, 16, 17, 21 and 23 can also be found in their entirety on the CD, since they each have many Web references.

This yearbook could not have come into existence were it not for the great effort and commitment to this project from the authors of the individual papers, from the Editorial Panel, from the stellar staff at the NCTM Reston office, and—most important—from Portia C. Elliott, general editor for the 2005 through 2007 NCTM Yearbooks. In addition to the general editor and the 2005 Yearbook editor, the 2005 Yearbook Editorial Panel consisted of the following individuals:

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*2005 Yearbook Editor*

## **Mission Statement**

NCTM yearbooks focus concerted attention on timely issues by viewing them in depth, from multiple perspectives, through interdisciplinary lenses, and across various grade bands.