

Recommended Readings

Logo Theory and Practice

by Dennis Harper

The publisher is Brooks/Cole Publishing Co., 511 Forest Lodge Road, Pacific Grove, CA 93950. Date of publication: 1989

(From the *Preface*): "Logo Theory and Practice gives the teacher with classroom experience in using Logo a detailed summary of what researchers, teachers, educational leaders, and children are saying about Logo. An additional purpose of this book is to present Logo to student teachers and inservice teachers who, realizing that Logo is more than a programming language, are interested in learning about its theory and practice."

The chapter titles include: Cognitive/Effective Effects of Logo, Logo Research, Teaching with Logo, Logo: A Project Approach, Turtle Tips,

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Computers in Elementary Mathematics Education, by Doug Clements

The publisher is Prentice Hall, Englewood Cliffs, NJ 07632. Date of publication: 1989. 415 pages.

I can't say enough about this book and the contribution that it makes to the field of computer education in mathematics. It's a marvelous resource for teachers to help them become knowledgeable about what it means and takes to teach mathematics effectively with technology. Though I think the intent of the book is to be used with perspective elementary teachers in college methods courses, I think it would be useful for anyone interested in doing inservice work with teachers.

Clements uses his strong research background to help him develop several sets of guidelines in using computers in mathematics.

For example, his initial guidelines are based on the

Research Highlight: Learning fractions while designing software makes a difference for children.

Harel, I. (1988). *SOFTWARE DESIGN FOR LEARNING MATHEMATICS: On Learning Logo and Fractions Through Instructional Software Design*

Idit Harel (MIT) has investigated fourth grade students' acquisition and understanding of fraction and ratio concepts after they have been exposed to different kinds of experiences with Logo. One group was asked to design software about fractions that they would then present to third graders. They also learned about fractions in the conventional way in their classrooms. The control groups received comparably fraction instruction but their Logo instruction was different. They were taught to program in Logo. No attempt was made to connect the fraction work with Logo. The former group outperformed the control groups in knowledge about fractions (as measured by a conventional standardized test) and in Logo knowledge and programming sophistication. They also demonstrated a greater willingness to persevere in problem solving activities. This result offers some concrete evidence of Papert's "empowerment" principle.

For more information on this study, write to the MIT Epistemology and Learning Center (address is on page 2.)

theories of Jean Piaget, Seymour Papert, Bob Davis, and Richard Skemp. One guideline says that teachers need to recognize that teaching mathematics meaningfully is not easy. "Students who are not accustomed to doing mathematics and reflecting on their learning may be confused and resistant to these approaches. The teacher

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