Monograph Review

Math Monograph No. 5: Calculators in the Classroom.

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This *Monograph* presents a variety of papers concerning the use of calculators by educators in Britain, the United States, and Canada. Some of the articles are original publications; others are reprints from other journals. They are organized with respect to five themes: opinions, specifications, research, activities for junior and senior high, and activities for elementary and junior high.

Part one, "Opinions," contains the following articles: "Calculators in the Classroom: Proceedings of a Symposium Sponsored by Rockwell International," "Calculating Machines in Schools," "Computational Skill is Passé," "The Influence of Calculators on Mathematics Curriculums," and "Calculators - a Review."

The first paper is a synopsis of comments made by a panel of university-affiliated educators as they discussed the promises and potentials of electronic calculators as teaching aids in arithmetic classes in middle grades (VI-IX). It also includes the question-and-answer session that followed the formal presentation.

In the second article the authors review priorities of arithmetical and mathematical education in light of the increased availability of calculators, make recommendations regarding the extent to which the use of calculating machines should be encouraged at various stages in education, and consider the types of machines most appropriate for school use.

The third article, which appeared in the *Mathematics Teacher*, consists of seven issues posed to a sample of teachers, mathematicians, and laymen. Included are their responses, given in percentage form, along with some of their positions and justifications.

In the fourth article, after a discussion of the effects of calculators on the curriculum, the author concludes that "educators will not be allowed to decide the issue of whether students will or will not use calculators. Students will use them.... But if curricular materials are designed to take full advantage of the power of the calculator as an educational tool, then perhaps student use of calculators will lead to increased mathematical achievement. Students may even find mathematics more interesting and more useful." (p.34)

In the last article in this section the author reviews some of the recent literature concerning the use of calculators in the classroom. She concludes that "the issue of calculator use in schools continues to be debated and the questions arising are being investigated by educational researchers.... But curriculum changes will not appear overnight, they will only occur if and when teachers are convinced of the calculator's potential." (p.39)

Part two, "Specifications," contains two articles: "So You Want to Buy a Calculator" and "Specifications for Electronic Calculators." Both articles include a discussion of machine features that are felt to be most desirable for use in the classrooms. Thus they provide some guidelines that specify what to look for in a basic machine.

Part three, "Research," contains six articles: "Survey of the Use of Hand-Held Calculators in Mathematics Classes in the Secondary Schools of British Columbia," "The Effect of the Use of Desk Calculators on Achievement and Attitude of Children with Learning and Behavior Problems," "The Use of the Mini-Calculator in the Classroom," "Achievement and Attitudes of Ninth-Grade Students Using Conventional or Calculator-Based Algorithms," "Achievement and Attitude of Low-Achieving Ninth Graders," and "Pocket Calculator Experiment with Fifth and Sixth Graders."

Although the reader must keep in mind the limitations of each study, this research does provide the classroom teacher with some insight into the various ways the calculator can be used and some information as to which children may benefit from the use of this technological instrument. It is up to the teachers to study this research and consider implications for their students.

Part four, "Activities - Junior and Senior High," contains the following articles: "Using Electronic Calculators," "Programmable Calculators and Mini-Computers in High School Mathematics," "Some Uses of Programmable Calculators in Mathematics Teaching," "The Pocket Calculator as a Teaching Aid," and "The Hand Calculator in Secondary Mathematics." These articles contain an assortment of interesting ideas and activities for use in the secondary schools. Such topics as number patterns, trigonometry, functions and limits, programming, flow charting and simulations are explored.

Part five, "Activities - Elementary and Junior High," contains the following articles: "Exciting Excursions in Number Theory with an Electronic Calculator," "Experiences with the Hand-Held Calculator in Teaching Computation, Problem-Solving, and Fractions," "Games with the Pocket Calculator," "The Hand-Held Calculator," and "Problem-Solving Practice via Statistical Data." These articles contain high interest projects, games, and activities for the elementary and junior high students. Such activities as "Calculator Tales - Jaws," "Towards a Million," and "Target," are but a few of the many ideas discussed which should generate high interest and promote student involvement.

In the foreword the editor of the *Monograph* states, "You are encouraged to sample the opinions and make up your own mind, peruse the specifications and buy appropriately, study the research and select activities which will supplement and enrich the mathematics curriculum for your students." (p.3) This reviewer feels that this book fulfills its purpose. If you are looking for an informative resource book on calculators that will provide interesting food for thought, then this might be just what you are looking for.

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