
Editor's Comments

by

Sid Rachlin
The University of Calgary

The development of the ability to solve problems has long been recognized as one of the major goals of mathematics education. With the recommendation by the National Council of Teachers of Mathematics (NCTM) that "Problem Solving Must be the Focus of School Mathematics in the 1980's," the goal of teaching problem solving in the mathematics classroom has taken on the fervor of a campaign slogan. Still, there is only one group of people capable of attaining this goal: the classroom teachers.

Interest in problem solving is not new to Alberta's educators. Perhaps the finest work on the teaching of problem solving in the early childhood years was published by Doyal Nelson and Joan Kirkpatrick Worth of the University of Alberta in the 37th Yearbook of the NCTM. Long before the problem-solving bandwagon began to roll, Alberta Education noted in its 1977 Curriculum Guide for Elementary Mathematics that problem solving was a "unifying theme which permeates all the strands of the elementary school mathematics program." Representative of the new impetus for the teaching of problem solving are the changes suggested in the 1981 revision of Alberta Education's Curriculum Guide for Elementary Mathematics. The revised curriculum guide includes the learning of problem-solving skills as a separate strand. The authors of the guide are quick to point out that the inclusion of a problem-solving strand "is not intended to portray problem solving as a topic unto itself." Rather than a change in the curriculum, the inclusion of the problem-solving strand represents an effort to make teachers more aware of how they might teach for the development of problem-solving abilities. In order to help facilitate the teaching of the new scope and sequence of problem-solving skills, Alberta Education has produced a manual entitled Let Problem Solving Be The Focus in the 1980's. In addition to a scope and sequence chart of problem-solving skills for elementary mathematics categorized by Polya's four phases for solving problems (understanding the problem, devising a plan, carrying out the plan, and looking back), the manual provides an array of suitable problems for students of varying developmental abilities.

This edition of the Math Monograph provides teachers with a wide range of articles on the teaching of problem solving in the mathematics classroom. The monograph is separated into four sections: Understanding the Problem, Devising a Plan, Carrying Out the Plan, and Looking Back. The first section includes articles which provide a sense of the "problem" of teaching for problem solving: What is given? What is our goal? In general terms, how might the goal be attained? The second section provides suggested plans for attacking related classes of problems. The articles in part three focus on the solution to specific problems. Finally, the last section includes articles which reflect on the past, present, and future of teaching for problem solving. At times the placement of an article into a section was arbitrary: i.e., several articles could be placed comfortably within any one of the sections.

This monograph presents the thoughts of a diverse group of authors, representing seventeen states and provinces. Despite the diversity, two common threads run through the articles. The first is a common notion for the meaning of the word "problem." A problem is defined as a "task" which an individual attempts to resolve, given that this resolution is within the person's ability and it is not resolved by the person's immediate application of some algorithm. Resolution of the task is taken as the individual's belief, stated or implied, that he has obtained the "actual" solution. Whether or not a task is a problem is dependent on the characteristics of the individual and his attempted paths to resolution. The second common thread woven in the articles is the belief that the actions of the teachers can affect the development of their students' abilities to solve problems.

The articles included in this monograph have been specifically written for this audience. They are not reprinted from other publications. Several people are responsible for the selection and editing of the articles for the monograph. In the spring of 1980 over 40 letters soliciting submissions for possible inclusion in the monograph were sent to individuals speaking on the teaching of problem solving at meetings of the National Council of Teachers of Mathematics in Calgary, Regina and Seattle. Letters were also sent to appropriate speakers at the Vancouver meeting of the Research Council on Diagnostic and Prescriptive Mathematics. Under the guidance of Lyle Pagnucco and Rich King, at least four teachers reviewed each submission. Articles were accepted based on the recommendations of the reviewers and edited to avoid redundancy and to ensure that the examples provided were phrased appropriately for the intended audience. Later the articles were re-edited in an attempt to provide the greatest possible amount of information in a limited amount of space. For example, only those bibliographic entries specifically referred to in an article were included with the list of references at the end of each article. Readers interested in detailed bibliographies of mathematical problem solving are directed to Sarah Mason's annotated bibliography in the 1980 Yearbook of the NCTM and Frank Lester's chapter on problem-solving research in NCTM's Research in Mathematics Education.

Finally, it is with sincere appreciation that I acknowledge the skillful and dedicated efforts of Judy McDonald. It is through her technical skill that you are now able to share this edition of the MATH Monograph with your fellow teachers.