

Priorities in School Mathematics

Why?

The 1970s were characterized by heated discussions about new mathematics and the need for basic skills in mathematics to be addressed in school programs. Many of the on-going discussions were in need of research evidence that documented current practices and that also provided information about desired practices. Technology was advancing rapidly. Ideas for change and future direction of mathematics education were being sought by the National Council of Mathematics.

What?

In response to the need for research evidence, in 1977 the National Science Foundation funded the Priorities in School Mathematics Project (PRISM) to collect data “designed to illuminate differences between actual and desired practices” in K-14 mathematics. The data collection rested on extensive surveys of different populations, including:

- Subscribers to the Arithmetic Teacher
- Subscribers to the Mathematics Teacher
- Junior college mathematics teachers
- Mathematicians
- Supervisors of mathematics
- Principles of elementary/secondary schools
- Presidents of school-boards & parent teacher organizations.

Special surveys were tailored for each of these populations, but all surveys were designed to gather preferences and priorities for change. The surveys addressed nine curricular strands:

- Whole numbers
- Fractions and decimals
- Ratios, proportions, percentages
- Measurement
- Algebra
- Geometry
- Probability and statistics
- Computer Literacy
- Problem Solving

Within these curricular strands, feedback was sought in several different categories, including: alternative content topics, instructional goals, necessary resources to support teaching/learning, methods of instruction, provisions for particular groups of students, and ways of using calculators. Respondents were asked to judge the relative importance of curriculum alternatives and identify points in the mathematics curriculum where change seemed needed.

Over 10,000 surveys were sent between September 1978 and February 1979. The rate of return ranged from 15% to 60% for the different populations with an average of 29%.

Who?

Alan Osborne, The Ohio State University, was the PRISM Project director.
Jon Higgins, The Ohio State University; Peggy Kasten, The Ohio State University, and Marilyn Suydam, The Ohio State University were all part of the Project Team.

What was produced?

PRISM collected information that would guide mathematics education into the 1980s. A report Priorities in School Mathematics: Executive Summary of the PRISM Project was published by the National Council of Teachers of Mathematics in 1981. To a question about the level of satisfaction with school mathematics, the satisfied or very satisfied ranged from 25% to 79%. School board presidents (79%) and principals (76%) were at the high end and junior college teachers (28%) and mathematicians (25%) were at the low end of being satisfied or very satisfied with school mathematics. On another issue, a majority of all groups except teacher educators, supervisors and mathematicians agreed the more time should be spent on drill and practice.

Among the interesting results highlighted by Osborne (1980) are:

- Problem solving was viewed as a high priority and was overwhelmingly supported by all sample populations.
- Problem solving was also identified as an area where problem solving resources were needed to support instruction.
- Probability and statistics although deemed necessary for mathematical literacy in being able to handle and interpret data, was a source of conflicting views between the sample populations. For example, while over nearly 80% supported an elective course in probability and statistics, two-thirds of respondents rejected making a course in probability and statistics required.
- Use of calculators in the classroom was generally well received by all populations; however most wanted delay use until written algorithms were learned and many wanted to restrict the use of calculators to checking answers.
- Although many teachers considered ability to read mathematics an important goal there was not much support for using reading as a method or resource for teaching or learning mathematics.
- Mental computation and estimation skill was strongly supported (over 80%) as a goal by all populations, but no current text materials regularly addressed mental computation and estimation.
- In-service teacher training was seen as the most efficient method of implementing curricular change.
- Extremes in curricular practice were not well received.
- Computer literacy was well supported as an important goal of mathematics education, especially by the lay samples.
- Requiring mathematics for all students, beyond basic arithmetic, met with resistance.

Significance of the PRISM Report:

- Made available a large data base that reflected opinions, preferences and priorities on mathematics curriculum from a variety of different perspectives.
- Identified strong support among all populations to increased attention to problem solving.
- Supported the NCTM initiative to make problem solving a priority for the 1980s.
- Called attention to the importance of estimation and the lack of attention it was receiving in the mathematics curriculum.
- Helped stimulate the development of curricular material resources related to statistics, such as the Quantitative Literacy Series.
- Helped to shape the recommendations that were put forth in the NCTM Agenda for Action.

References:

Osborne, A. (1980). The NCTM PRISM Project: An attempt to make curriculum change more rational and systematic, Edited by R. Morris in Studies in Mathematics Education, pp. 119-132, France: UNESCO, Inc.

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Suydam, M. & Higgins, J. (1980). PRISM: Shedding light on NCTM's recommendations for the 1980s, Mathematics Teacher, 73(9), 646-647, (December).