

# EFFECTS OF PROBLEM POSING INSTRUCTION

Joanne Rossi Becker, San José State University, USA

This poster presents results from a graduate problem-solving course for prospective secondary school mathematics teachers. Data from thirty-two students includes attitudinal and mathematical data. The paper briefly describes patterns in responses to journal prompts and portfolio questions collected throughout the semester that probed students' beliefs about mathematics and its teaching, and in particular, the role of problem solving in the curriculum. Midterm exam questions asked students to pose new problems from given situations.

The course from which the data were collected is required for those seeking a secondary credential in mathematics at San José State University. The course has several goals, but the primary one is to help future teachers change in their views of mathematics teaching and learning, so that their role as a teacher will be that of a facilitator, and classroom practices will emphasize problem solving. One of the themes of the course was problem posing, an activity in which the solution of a given problem is not the principal objective, but rather the development of new problems which may or may not be solved. As mathematics education has increased its emphasis on problem solving, there has been a concomitant interest in problem posing.

The two problems given related to Pascal's Triangle and Odd and Even Numbers. I categorized the types of problems students posed relative to these two situations, as well as the number of well-formulated new problems. Students were able to pose well-formulated new questions, but had more difficulty developing questions leading to generalization.

Journal and portfolio prompts asked students, for example, to distinguish between a problem and an exercise, and agree or disagree with the following statement: "Students should not be exposed to problem solving until they have mastered all the requisite skills." Written responses indicate a clear growth in understanding of the nature of problem solving and its role in the high school curriculum. I conclude that a course in problem solving holds promise for shifting future teachers from an instrumentalist to a problem-solving view of mathematics.

The poster will include a brief outline of the course, sample journal prompts and student responses, and sample problems posed in response to the original mathematical situations.