

## Cal Poly Pomona, Mathematics Ed Colloquium

### Teaching and Learning Mathematics with Technology

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This presentation will briefly report several research studies that I conducted in the recent years. These studies investigated the following research topics: 1) middle school students' learning of introductory probability with a computer microworld, 2) pre-service teachers' development of mathematical reasoning and proof abilities using the Geometer's Sketchpad, 3) middle and high school students' development of three-dimensional visualization in a Dynamic Geometry environment, 4) the impact of the early field experiences within an on-campus middle and high school program on the growth of pre-service mathematics teachers, and 5) the impact of the mathematical modeling approach on the content and pedagogical knowledge of mathematics teachers, their teaching styles, and the learning performance of their students. While one or two of the studies used a quantitative research method (experimental design), the main research methods used for the studies were qualitative - constructivist teaching experiments and case studies. The emphasis was to investigate the actual learning processes as students (and teachers) construct their mathematics knowledge and develop their problem solving abilities in technology-oriented learning environments. Among the research findings are the subjects' thinking modes, their new learning styles, and their critical developmental points. In the presentation, some of the technology environments designed to facilitate students' learning will be introduced. These environments were found to be beneficial in multiple aspects of mathematics teaching and learning.

**This talk takes place Tuesday, January 30, 2007 from 12:05-12:50 in Building 8, Room 156.**