



The Rice University
School Mathematics
Project
Past Impact and Future
Research

What is RUSMP?

The Rice University School Mathematics Project (RUSMP) was established to serve as a bridge between the Rice University mathematics research community and area math teachers



The Mission of RUSMP

- ✓ To improve teachers' and administrators' understanding of mathematics
- ✓ To enhance the mathematical and pedagogical knowledge of teachers on the Houston area



Programs and Courses

- ✓ Summer Campus Program
- ✓ Urban Programs
- ✓ Annual Fall and Spring Networking Conferences
- ✓ Academic-Year Graduate Courses
- ✓ Academic-Year Non-Credit Courses
- ✓ Technology Training and Workshops

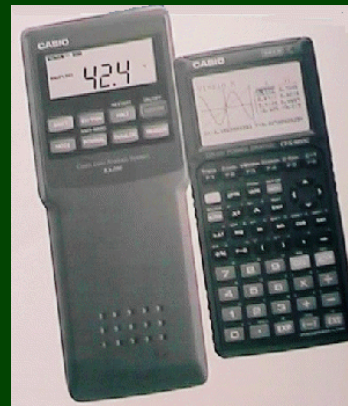
Collaborations

- ✓ Houston ISD Algebra Initiative
- ✓ Ninth-Grade Success Initiative
- ✓ Project GRAD
- ✓ GK-12 Fellows



Instruction & Curriculum

- ✓ RUSMP's Teaching Goals:
 - ✓ develop important mathematical concepts
 - ✓ emphasize student thinking, activities, creativity, and products
 - ✓ make connections with the real world
 - ✓ integrate manipulatives, calculators, and computers
 - ✓ foster discovery and group activities



Obstacles to Reform

- ✓ Teachers' beliefs about teaching and learning mathematics
- ✓ Teachers' inexperience with new approaches
- ✓ Teachers' lack of content knowledge
- ✓ Structure of teachers' professional lives
- ✓ Lack of administrative support

What Does RUSMP Do?

- ✓ Instruction to content
- ✓ Reform-based approaches
- ✓ Collaborative planning
- ✓ Master teachers as mentors
- ✓ Close ties with administrators

Impact

- ✓ Cited as one of the top four professional development programs in the elementary grades, one of the top two in the high school grades (Killion, 2002), and one of the top seven in the middle school grades (Killion, 1999)
- ✓ The practices of teachers who have participated in the summer program have become better aligned with the NCTM *Standards*
- ✓ Teachers' mathematical knowledge has increased
- ✓ Students do significantly better on standardized tests
- ✓ Increases in scores on the math section of the TAAS, reduced drop-out rates, increased interest in math, & increased collaboration among teachers
- ✓ Nearly 4,000 teachers have participated since 1987

Research at RUSMP

- ✓ Instructional Change
- ✓ Teachers
- ✓ Students
- ✓ Classroom Observations



Program Evaluation

- ✓ Surveys
 - ✓ self-efficacy
 - ✓ beliefs about mathematics
 - ✓ beliefs about teaching and learning mathematics
- ✓ Classroom observations
 - ✓ changes in instruction



Potential Research Topics

- ✓ Teacher efficacy
 - ✓ "The extent to which the teacher believes he or she can affect student performance" (Berman et al., 1977)
 - ✓ A teacher's sense of efficacy will impact their classroom practices

Potential Research Topics

- ✓ Teacher efficacy
 - ✓ What contributes to strong teacher efficacy?
 - ✓ How malleable is a teacher's sense of efficacy?
 - ✓ Does stability of efficacy change over career stages or across contexts?
 - ✓ How is the principal's leadership linked to teacher efficacy?
 - ✓ How is individual teacher efficacy linked to the collective efficacy of a school?

Potential Research Topics

- ✓ Teacher efficacy
 - ✓ Low teacher efficacy leads to low student efficacy and low achievement, which in turn leads to further declines in teacher efficacy
 - ✓ Efficacy is especially interesting in the context of educational reform - as teachers are compelled to use new, unfamiliar techniques which may lower their self-efficacy

Potential Research Topics

- ✓ Collaboration - the Japanese model of professional development
 - ✓ American model of professional development is built around self-motivation
 - ✓ Japanese programs use a peer-based model
 - ✓ Japanese study classes or research lessons - demonstration lessons observed by other teachers and subject experts

Potential Research Topics

✓ Collaboration

- ✓ What role does peer feedback play in teachers' performance?
- ✓ How does collaboration affect lesson planning?
- ✓ Are there individual differences in the extent to which collaboration can benefit a teacher?
- ✓ How can a school best promote collaboration among its teachers?