



## What's a McSiip?

McSiip was established in Fall 1984 as the South Jersey Math, Computer, and Science Instructional Improvement Program, with funding from the Eisenhower Higher Education Professional Development Program. Over the first six years, McSiip provided a variety of professional development activities in all three content areas for more than 8,000 teachers. These ranged from one-day workshops in schools to multi-year projects. Since that time, McSiip has received funding from the National Science Foundation, the U.S. Department of Education, and the State of New Jersey for other specific projects. McSiip has provided high-quality professional development for more than 16,000 elementary, middle, and high school teachers of mathematics and science in more than 200 districts since 1984.

## This We Believe

McSiip's professional development activities are based on research about how students best learn mathematics and science, how teachers can most effectively teach science and mathematics, and how adults learn.

Students learn mathematics and science by doing, constructing meaning for new concepts and principles and attaching these meanings to pre-existing notions. Skills and knowledge are developed simultaneously with conceptual understanding and problem solving. All of these areas develop along a continuum, from not understanding anything about a topic through basic understandings of elementary principles to fuller understandings of concepts and their interrelationships.

In order to teach effectively, teachers of science and mathematics must engage students in interesting problems, allowing them to develop concepts for themselves. Teachers need to learn to listen to their students, ask good questions, and scaffold instruction to support learning for all students. Teachers also need to develop deep understanding of the concepts and principles central to their discipline, as they build connections within the discipline and across subjects.

Professional development needs to provide three things for teachers of mathematics and science: ideas for them to use immediately in the classroom, deeper understanding of the content they teach, and an expanded repertoire of instructional strategies to use in helping students learn. It is important

to use new ideas immediately, since what is not used is usually lost. Combining content and pedagogy to help teachers not only to provide better content but also to teach that content better is essential.

**Teachers need to develop deep understanding of the concepts and principles central to their discipline**

McSiip's professional development is varied, providing for the differing needs of teachers of science and mathematics. Brief, one-day experiences increase awareness,

create a need for further information, and, in some cases, spur motivated teachers to research and develop ideas and concepts further on their own. Multi-day workshops provide opportunities for more intensive learning to take place, with teachers often supporting each other on their return to the classroom. Extended projects provide ongoing professional development for teachers over time, often with in-class mentoring and on-line support and discussion.

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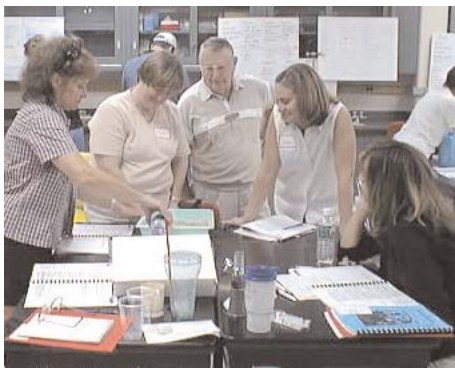
# Effective Professional Development

McSiip provides for each of the following research-based characteristics of effective professional development:

- ♦ **Collegiality and Collaboration** - Activities are collaboratively planned, involving teams of faculty and staff, with district input as appropriate. Participants are provided with opportunities to share ideas, successes, and concerns as they work together on mathematics and science tasks. Groups are small, so that each participant can receive individual attention.
- ♦ **Experimentation and Risk Taking** - In McSiip activities, teachers have the opportunity to learn about the latest research on teaching science and mathematics. Faculty and staff alike encourage teachers to try out new activities and new instructional strategies.
- ♦ **Participant Involvement in Appropriate Aspects** - Participants often have opportunities to shape the professional development experience to more closely meet their needs. All activities are customized for the purpose and audience, while focusing on the content of the New Jersey Core Curriculum Standards.
- ♦ **Time to Participate and Practice** - Teachers have ample opportunities to participate in doing math and science. In most activities, they also have opportunities to apply what they have learned in their own classroom and to share those experiences.
- ♦ **Use of Available Knowledge Bases** - Presenters are passionate about sharing the latest research on how children learn and how best to teach.
- ♦ **Leadership and Sustained Support** - Whenever possible, McSiip seeks to work with districts to ensure that leadership provides ongoing support for the new behaviors learned through professional development.
- ♦ **Appropriate Incentives and Rewards** - McSiip provides professional development credits for all activities. Stipends for participation are sometimes available for funded projects.
- ♦ **Application of Knowledge about Adult Learning and Change** - McSiip activities are based on this knowledge and build opportunities for teachers to develop and grow.



Clayton NJSSI participants



John Faubl, MSP Science workshop

## Feedback from teachers and administrators

- ♦ *This program has been central & instrumental in our district's curriculum and instructional reform.*
- ♦ *Program provides great insight, resources, and time.*
- ♦ *Had wonderful food for thought and validation that we are on the right track.*
- ♦ *I liked that we could spend a good amount of time on issues specific to our district's goal of implementing a new science curriculum.*
- ♦ *This process has been and continues to be a wonderful learning experience for me.*
- ♦ *It was a wonderful learning experience and I would highly recommend it to other schools! .*
- ♦ *I got some great ideas for teaching math and science. Realized I need to change some of my teaching methods*
- ♦ *Information provided was very worthwhile. It was helpful to enhance what we already have in place. We are learning a lot about ourselves in the process.*

# Innovative and Effective Professional Development

McSiip provides a variety of standards-based professional development activities each year, with the specific offerings determined by the projects currently funded. Some of the ongoing themes are described here.



*Dr. Eric Milou*

## Graduate Courses

McSiip has attracted numerous students to graduate programs by offering reduced-tuition for activities associated with specific projects. Examples include the current South Jersey Math Partnership, in which middle school math and science teachers are able to earn up to 15 graduate credits; computer science teacher training in the 1980s (16 sh of graduate credit); elementary science and math fellows programs in the 1980s (9 sh of graduate credit); and an interdisciplinary K-8 math/science program in the early years of NJ SSI (9 sh).

## New Teacher Institute

This one-week institute, offered for middle and high school science and mathematics teachers in their first two years of teaching, bridges the gap between the theory learned in undergraduate teacher preparation courses and the reality of the classroom. Participants work with exemplary teachers and supervisors, as well as Rowan faculty, to plan for the courses they will actually teach. They also learn ways to establish their classroom as a learning community and to foster higher-order thinking and reasoning in math and science.

## Assessment Institutes

These two or three-day sessions provide not only an overview of the statewide assessments in math or science (NJ ASK, GEPA, or HSPA) but also help deepen participants understanding of state standards. Teachers experience hands-on inquiry-based learning and open-ended assessment.

## Teacher Leaders

Several projects have included activities that focus on building the capacity of teacher leaders. The Rowan Camden Math Project involves working with Camden's elementary and middle school math coaches to help them develop content understanding and coaching skills. The NSF Math Science Partnership included summer institutes and followup for teacher leaders at all grade levels. Projects from the 1980s such as the Elementary Science Fellows and the Elementary Math Fellows provided professional development for teacher leaders as well; many of these participants are now principals, supervisors, coaches, and department chairs in local districts.



*McSiip Forensics Workshop*

## Distance Learning

McSiip has used two different approaches to professional development that include distance learning along with some on-site workshops. One such project provided 30 hours of professional development focusing on geometry and measurement in the elementary grades. Participants met for three days at Rowan, at four-week intervals, with online and study group assignments between each on-site meeting. Still another project involved sixteen weeks of study group meetings at each participating school over the course of a semester. The facilitators for these study group meetings were trained by McSiip staff. Participants also posted summaries of their discussions weekly for review and discussion across sites.

## Curriculum Focus

McSiip faculty and staff often provide specific training for districts adopting new instructional materials in science and mathematics, including STC, STC-MS, CEPUP, Connected Math, Core-Plus, and other programs.

## Resource Center



*McSiip Math Resource Room*

McSiip's Resource Center, consisting of more than 8000 items, is available to Rowan students and area teachers free of charge. Included in the Center are textbooks, supplementary materials, videos, software, science kits, and math manipulatives. Small groups from local districts are welcome to make an appointment to preview specific programs, with assistance from Center staff.



*John Faubl, Science Resource Room*

# McSiip Gets Results!!!

## Impact at Rowan

- ◆ McSiip initiated the South Jersey Programming Contest for area high schools in the 1980s in collaboration with the Department of Mathematics and Computer Science. This contest is currently run each year by the Computer Science Department at Rowan.
- ◆ McSiip contributed substantially to the development of the liberal studies math/science major through funding for course development by interdisciplinary teams of faculty.
- ◆ McSiip has provided substantial graduate coursework for South Jersey teachers in elementary and middle school mathematics, elementary and middle school science, and computer science. This has led to the development of Certificates of Graduate Study in middle school math and science.



## GEPA Gains in Lindenwold

The NJ SSI Regional Center at Rowan University provided Lindenwold with professional development and mentoring in science in all the middle school and special education teachers in the district. Over the past four years, Joanna DiStasi, mathematics supervisor, and Richard Fitch, science supervisor, have noted the dramatic rise in GEPA test results: more than 31% for total students in mathematics, and almost 17% in science.

## Improved Content Knowledge for Teachers

Participating teachers typically show statistically significant increases in content knowledge after participating in ongoing professional development activities designed to address content knowledge. Examples include:

- ◆ South Jersey Math Project, 2003-2007 ( $p < .001$ )
- ◆ Algebra Institute, NJ MSP, Summer 2004 ( $p < .001$ )
- ◆ Geometry Institute, NJ MSP, 2003
- ◆ Elementary Math Fellows, McSiip, 1989-1990

## Improved Pedagogy for Teachers

Participating teachers typically show significant changes in teaching behaviors, implementing research-based, effective pedagogical practices more frequently. Examples include:

- ◆ South Jersey Math Project, 2003 - 2007
- ◆ Project SMART, 1996-2001
- ◆ Elementary Math Fellows, McSiip, 1989-1990
- ◆ Meaning in Math, McSiip, 1988-1989

## Improved Teacher Attitudes

Projects such as the Elementary Science Fellows (McSiip, 1988-1989) that are designed to improve teacher attitudes have accomplished significant results.

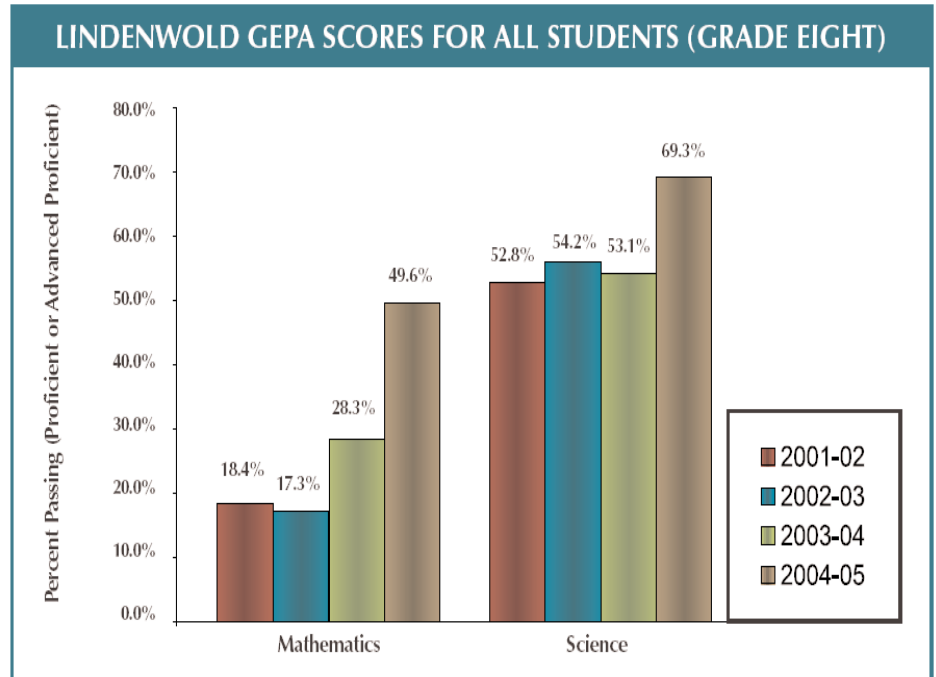
## Improved Student Achievement

A number of projects have demonstrated significant positive impact on student achievement, including the following:

- ◆ South Jersey Math Project, 2003-2007 ( $p < .001$ )
- ◆ Elementary Science Fellows, McSiip, 1988-1989
- ◆ Meaning in Math, McSiip, 1986-1989
- ◆ Rational Numbers Project, McSiip, 1983-1986

## High-Quality Professional Development

More than 90% of McSiip's professional development activities have been rated above 4.00 on a five-point scale for overall quality.



# Major Grants Awarded to McSiip

## McSiip

McSiip, funded by the New Jersey Department of Education from 1984 through 1990, began by offering professional development activities in math, science, and computer education. McSiip soon established itself as a center for excellence. In 1986, McSiip was one of only ten projects out of a field of more than 400 applicants nationally recognized for excellence in science and mathematics in a study funded by the National Science Foundation (COS-MOS, 1986). McSiip continues to provide a variety of professional development offerings in science and mathematics each year.

## Project SMART

Project SMART (1996 -2001) was a collaborative professional development program for K-12 science and mathematics teachers in Camden, Gloucester City, and Pennsauken. This project, an Eisenhower Higher Education Professional Development Program, provided a variety of professional development opportunities for teachers in these districts, as well as followup in-class support. Approximately twenty teachers from the districts functioned as mentors for their colleagues, assisting them in locating appropriate resources and providing workshops. Project facilitators also provided workshops, taught demonstration lessons, consulted with project participants, and provided followup to professional development activities.

## RCMP

The Rowan Camden Math Partnership (2006-present) was developed by Dr. Jill Perry and Dr. Janet Caldwell in conjunction with the Camden City Schools. This project involves providing professional development for Camden's elementary and middle school math coaches and ongoing support for them in their roles in the schools. It also involves work with novice and mentor teachers and a two-week institute each spring for Rowan preservice math and math/science liberal studies majors in a Camden school

## NJMSP

New Jersey Math Science Partnership (2002-2006), funded by the National Science Foundation, involved Rowan, Rutgers, and twelve districts across the state in a partnership to improve science and mathematics achievement.

Rowan worked primarily with Bridgeton, Millville, Toms River, and Vineland to provide assistance to the districts, professional development focusing on science and mathematics content, leadership institutes for teacher leaders, and a New Teacher Institute. Science and mathematics faculty, working with project staff, education faculty, and district leaders, have played an important role in planning and presenting professional development.



*SJMP Participants at Goddard Space Center*

## SJMP

The South Jersey Math Partnership (2004-present), directed by Dr. Eric Milou, provides intensive professional development for middle school mathematics and science teachers who are not certified in those areas. Mathematics courses completed by the participants include each of the content areas included in the New Jersey Core Curriculum Standards: number, geometry, algebra, and data analysis, probability, & discrete mathematics. Science participants complete courses in biology, physical sciences, and astronomy. Participants have the option to receive up to 15 semester hours of graduate credit toward Certificates of Graduate Study and may receive a middle school endorsement for teaching mathematics or science.



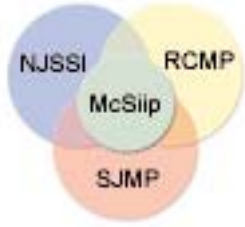
*Millville School District NJSSI Partnership Program*

## NJSSI

The New Jersey Statewide Systemic Initiative (NJ SSI) began as an NSF-funded program in 1993. In its first five years, Rowan functioned as a major partner in this program, providing leadership for the initiative as well as professional development in science, mathematics, and technology for school-based teams of K-8 teachers. During this time, Rowan also worked closely with Pennsauken, one of the districts receiving direct funding from NJ SSI to improve mathematics and science learning. Rowan established a resource center which now contains more than 4000 items, including books, manipulatives, science kits, software, and videos. This project provided the impetus for establishing the current undergraduate major in mathematics and science in liberal studies by funding course development by interdisciplinary faculty teams. NJ SSI's Partnership Program has helped more than thirty districts to develop strategic plans for improving science and mathematics instruction through a twelve-day professional development program. Rowan continues to provide professional development and technical assistance to these districts and others who have been funded by NJ SSI to implement standards-based science and mathematics programs.



*Project SMART Participants*



# Current McSiip Staff

## Dr. Janet Caldwell

The founder and Director of McSiip is Dr. Janet H. Caldwell, Professor of Mathematics (B.A., Rice University 1972; Ph.D., University of Pennsylvania, 1977). Dr. Caldwell is widely respected as a teacher, having been recognized by the Carnegie Foundation in 1994 as the New Jersey Professor of the Year. She also received the NJ Section of the Mathematical Association of America's Distinguished Teaching Award in 2000. She is noted for her contributions to mathematics education in New Jersey, receiving awards from the Association of Mathematics Teachers of New Jersey and from the New Jersey Association for



*Dr. Janet Caldwell,  
Professor of Mathematics  
SJMP, RCMP and McSiip Director*

Supervision and Curriculum Development. She has participated on numerous state policy committees, including the New Jersey Core Curriculum Standards Committees.

## Dr. Eric Milou

Dr. Eric Milou, Professor of Mathematics (B.A., Franklin & Marshall, 1988; M.A., West Chester University, 1994; Ed.D. Temple University, 1998) also directs McSiip projects, including the South Jersey Math Science Partnership. Dr. Milou is a past president of the Association of Mathematics Teachers of New Jersey and is involved in leadership activities at the state and national levels. He is also recognized as an outstanding teacher.



*Dr. Eric Milou,  
Professor of Mathematics  
SJMP Director*



*Marybeth Hegel*

## NJSSI

### New Jersey Statewide Systemic Initiative

Marybeth Hegel, Program Coordinator  
John Faubl, Assistant Director  
Ellen Rothschild, Assistant Director  
Mary Hartmen, Resource Manager



*Ellen Rothschild*



*Alexis Kopperman*

## RCMP

### Rowan Camden Math Partnership

Marybeth Hegel, Program Coordinator  
Alexis Kopperman, Facilitator  
Diane Healey, Facilitator  
Mary Lou Lucas, Facilitator



*Diane Healey*



*Jenny Murphy*

## SJMP

### South Jersey Math Partnership

Jenny Murphy, Program Assistant  
Art Knudsen, Facilitator  
John Faubl, Facilitator  
Angela Naopliello-Ivory, Facilitator  
Alexis Kopperman, Facilitator  
Gerry Butler, Facilitator  
Bill Smith, Facilitator  
Melissa Jackson, Master Teacher



*Bill Smith*

# Faculty Involvement

McSiip has always benefited from the involvement of Rowan faculty throughout the University. Faculty have contributed through leadership, scholarship, teaching, and advising.

## Current Projects

### SJMP

Dr. Jill Perry, College of Education  
Dr. John Chen, College of Engineering  
Dr. Maria Tahmont, Biology  
Dr. Robert Newland, Chemistry  
Dr. Karen Heinz, Mathematics  
Dr. Marlena Herman, Mathematics  
Dr. Paul Laumakis, Mathematics  
Dr. David Klassen, Physics  
Keith Johnson, Physics & Astronomy  
Shelly Berman, College of Education



*Dr. John Chen, College of Engineering*

### RCMP

Dr. Jill Perry, College of Education  
Dr. Karen Heinz, Mathematics  
Shelly Berman, College of Education



*Dr. Michael Grove, Biology*

## Past Projects



*Dr. Jeff Hettinger, Physics*

### College of Liberal Arts and Sciences

#### Biology

Dr. Michael Grove  
Dr. Richard Meagher  
Dr. Pat Mosto  
Dr. Gary Patterson  
Dr. Andrew Prieto  
Dr. Joanne Scott  
Dr. Maria Tahamont

#### Chemistry

Dr. Mark Chamberlain  
Dr. Lee Dinsmore  
Dr. Richard Frazee  
Joseph Waring

#### Computer Science

Dr. Seth Bergmann  
Jack Cimprich  
Dr. Donald Stone  
Leigh Weiss

#### Foreign Languages

Dr. Sonia Spencer

#### Mathematics

Dr. Ronald Czochoz  
Dr. Gary Itzkowitz  
Dr. Robert Kotzen  
Dr. Fran Masat  
Robert Mitchell  
Dr. Iljay Olicasu  
Dr. Tom Osler  
Dr. Dexter Whittinghill  
Carol Winkie

#### Physics

Dr. E.J. Guerra  
Dr. Jeffrey Hettinger  
Dr. Sam Loffland  
Dr. Karen Magee Sauer

#### Sociology

Dr. Virginia Brown  
Dr. DeMond Miller

### College of Education

Dr. Jody Blohm  
Dr. Robert Blough  
Dr. Estelle Brown  
Dr. Carl Calliari  
Dr. Marianne Cinaglia  
Dr. Ethel Combs  
Dr. Tom Gallia



*Dr. Jill Perry, College of Education*

Dr. Carolyn Hamlet  
Dr. Lou Molinari  
Dr. Joseph Pizzillo  
Dr. Yvonne Rodriguez  
Dr. Tonya Santangelo  
Carmelo Sorrentino  
Dr. Susan Taber  
Dr. Margaret Tannenbaum  
Dr. Mario Tomei  
Dr. Beth Wassell  
Dr. Austin Winther

### College of Fine & Performing Arts

Dr. John Gallinelli



*Dr. Susan Taber, College of Education*

# Additional Staff



*Diane Fortuna*

McSiip has benefited from the involvement of many different people, including current and former K-12 teachers and administrators, professional and clerical staff, and student interns. Current staff are listed on the previous page. Other individuals who have participated in multiple projects are listed only under the first project in which they were involved. We also wish to thank the many teachers and administrators who presented workshops or participated in more limited ways in McSiip activities; our apologies if you are not included here.



*Kristin Nardone*

## McSiip

Gail Trucano, Administrative Coordinator  
 Thomas Buscemi, Math Supervisor (retired), Vineland  
 Sharon Danfield, Principal, Southampton  
 Diane Fortuna, Math Teacher, Gateway Regional  
 Marti Gibbons, Principal, Pennsauken  
 Tom Lord, Science Teacher  
 Ken Rideout, Computer Education Teacher  
 Pat Demetor, Secretary

## Project SMART

Facilitators  
 Beth Aaron  
 Sue McComb  
 Barbara Middleton  
 Eric Olandt  
 Sandra Parker  
 Marilyn Pugach  
 John Hermann, Science Supervisor, Ocean City  
 Mary Capriotti, Math & Science Supervisor, Pemberton  
 June Ertl, Secretary  
 Kim Funkhouser, Secretary

## NJ Math Science Partnership

Maureen Baniky, Science Coach (retired), Vineland



*Barbara Middleton*

## SJMP

Jacqueline Murphy, Math Supervisor (retired), Pittsfield  
 Robin Sole, Math Teacher, Woodbury  
 Pat Walsh, Math Coach, Monroe Township  
 Diane Fortuna, Math Teacher, Gateway

## NJ SSI

Eileen Egan, Math Supervisor, Pennsauken  
 Pam Simmerman, Gloucester County College  
 Claire Correale, Burlington County College

## Student Interns



*Kristy Erickson*

Chris Bovaso  
 Alex Chin  
 Stephanie Cohen  
 Magda Colon  
 Michele Desmond  
 Kristy Erickson  
 Colleen Fitzgerald  
 Kelly Grasser  
 Nicole Grasser  
 Henry Hartman  
 Mary Knighton

Stephen Hartman  
 Natasha Huester  
 Katryna Kruzement-Prykhodko  
 Kyungnam Lee  
 David Mantell  
 Kristin Nardone  
 Juliet Newell  
 Larry Ognibene  
 Mollie Steward  
 Cathy Toscano  
 Jerry Tigie



*Maureen Baniky*



*Mary Hartman and Kim Funkhouser*