

RESEARCH PRESESSION

The 70th Annual Meeting of the National
Council of Teachers of Mathematics

Monday, 30 March to Wednesday, 1 April 1992

Nashville Stouffer Hotel
Nashville, Tennessee

Sponsored by

Research Advisory Committee of the
National Council of Teachers of Mathematics

Special Interest Group for Research in Mathematics Education
of the American Educational Research Association

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University of Maryland

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Announcements

All Monday and Tuesday sessions are in the Nashville Stouffer Hotel.

Informal gatherings may be held in Director Rooms 1 and 2. The room is available from 9:00 am to 5:00 pm on Tuesday.

Notes: All organizers are reminded to allow a minimum of 15 minutes per session for general discussion; There may be a limit to the number of participants allowed into worksessions. Check to see if there are sign-up sheets at the doors.

The following people will serve as timekeepers for the NCTM Research Presession:
Bennie Adams, University of Missouri - St. Louis
Lateef Adelani, Harris-Stowe State College
Piyush Agrawal, Dade County Public Schools, FL
John Behle, Harris Stowe State College
Sarah Berenson, North Carolina State University
Rick Billstein, University of Montana
Lewis Coon, Eastern Illinois University
John Dalida, Kansas State University
Jane Keleher, Vernon Public Schools, Vernon, CT
Barbara Pence, San Jose State University

Monday, March 30 1992

7:15 - 7:30 pm

Tennessee Room

Welcome

Patricia Campbell, University of Maryland
Chair, NCTM Research Advisory Committee

Joan Ferrini-Mundy, University of New Hampshire
Co-Chair, AERA Special Interest Group for Research in Mathematics Education

7:30 - 9:00 pm

Tennessee Room

Issues in Reporting Research Results: Personal Observations

Speakers Thomas Carpenter, University of Wisconsin
 Frank Lester, Indiana University

Remarks from the outgoing and incoming editors of the *Journal for Research in Mathematics Education*. Questions will be addressed such as: What is evidence? How can research methods be reported so as to allow the reader a chance to scrutinize what was done?

The talks will be followed by a "Thank You Roast" organized by friends of Tom Carpenter.

Following the Talk
Coffee and Desert Reception courtesy of Dale Seymour Publications
in the Tennessee Foyer

9:00 - 10:30 am

Davidson B

Multi-digit Subtraction: Explanations of its Difficulty and Possible Solutions

- Organizer/Presider** Sharon Ross, California State University - Chico
- Presenters** Thomas Carpenter, University of Wisconsin - Madison
James Hiebert, University of Delaware
Constance Kamii, University of Alabama
Diane Wearne, University of Delaware
- Research Symposium** The presenters have observed that multi-digit subtraction with regrouping is much harder for primary-age children than multi-digit addition with regrouping. Explanations and possible solutions will be discussed from three theoretical perspectives.
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9:00 - 10:30 am

Davidson C

Monitoring Teacher Growth: The Kentucky K-4 Mathematics Specialist Program

- Organizer/Presenter** William Bush*, University of Kentucky
- Presenters** Joseph Baust, Murray State University
Robb Gaskins, University of Kentucky
Doug Jones*, University of Kentucky
Kathy Liptak, University of Kentucky
Susan Nichols, University of Kentucky
Mary Shake*, University of Kentucky
Ella Simmons, University of Louisville
Wanda Weidemann*, Western Kentucky University
- Discussants** Grayson Wheatley, Florida State University
Frank Lester, Indiana University
- Thematic Presentation** In this session, we will present data from the Kentucky K-4 Mathematics Specialist Program concerning the levels of use and stages of concerns of elementary mathematics teachers engaged in long-term professional development.

* indicates speakers

9:00 - 12:15 pm

Ryman North

**Research in Mathematical Communication: Clarifying the Issues
A Research Catalyst Conference Working Group**

- Organizer/Presenter** Laura Coffin Koch, University of Minnesota
- Presider** Catherine Brown, Virginia Polytechnic Institute and State University
- Presenters** Raffaella Borasi, University of Rochester
Deborah Carey, University of Maryland - College Park
Frances Curcio, Queens College
Karen Graham, University of New Hampshire
Adalira Saenz-Ludlow, Northern Illinois University
Bonnie Whitley, William Byrd High, Vinton, VA
Stephen Williams, Washington State University
Erna Yackel, Purdue University Calumet
- Discussant** David Pimm, Simon Fraser University
- Work Session** This session is designed to involve participants and attendees in a discussion of the theoretical and methodological framework related to research in mathematical communication. The Mathematics as Communication Catalyst Group seeks to interface mathematical communication into other research focus areas.
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9:00 - 10:30 am, 10:45 - 12:15 pm

Ryman South

**Research Methodology and Issues Surrounding
the Use of Graphing Technology**

Part I The Role of Graphing

Organizer/Presenter Alan Osborne, Ohio State University

Presenters Christine Browning, Western Michigan University
Gregory Foley, Sam Houston State University
John Harvey, University of Wisconsin - Madison
Jeri Nichols, Bowling Green State University

Discussant James Fey, University of Maryland - College Park

Part II Measuring the Impact

Organizer/Presenter Alan Osborne, Ohio State University

Presenters Penelope Dunham, Hanover, IN
Ann Farrell, Wright State University
Beverly Rich, Illinois State University
Charles Von der Embse, Central Michigan University

Discussant James Fey, University of Maryland - College Park

Symposium This symposium assesses the impact of graphing technology on research methodology and issues concerning representational ability, classroom climate, problem solving, and student achievement. Presenters will synthesize a series of related studies with common instructional materials.

Note: these sessions are independent; it is not necessary to attend both parts.

10:45 - 12:15 pm

Davidson A

**Methodologies for Studying Teacher Change
in the Reform of School Mathematics**

Organizers/Presenters Elizabeth Fennema, University of Wisconsin - Madison
Barbara Nelson, Education Development Center

Work Session The National Center for Research in Mathematical Sciences Education at the University of Wisconsin and the Center for the Development of Teaching at EDC have co-sponsored two informal conferences at which researchers studying teacher change in the reform of school mathematics have considered conceptual and methodological issues in the area. Issues of interest have included: identifying the elements of the system of teaching in which one would expect to find change; identifying emerging patterns of teacher development; issues of sampling and generalizability; and a range of issues about research procedures. We are interested in extending the discussion to additional members of the mathematics education research community. Informal discussion by all attendees of three or four salient issues in doing research on teacher change will be the focus.

10:45 - 12:15 pm

Davidson C

**Using Assessment to Promote Systemic Change in
Mathematics Learning: The New Standards Project**

Organizer/Presenter Lauren Resnick, University of Pittsburgh - LRDC

Presenters Diane Briars, Pittsburgh Public Schools
Daniel Resnick, University of Pittsburgh - LRDC
Sharon Lesgold, University of Pittsburgh - LRDC

Discussants David Clarke, Australian Catholic University
Tom Rowan, Montgomery County Public Schools, MD

Thematic Presentation What is the *New Standards Project*? What are *Standards*? What does it mean to *measure* student performance? Is systemic assessment of this magnitude possible? These and related questions are explored in this session.

10:45 - 3:00 pm

Davidson B

Documenting Teacher Practice: Implementation of the Standards

- Organizer/Presenter Linda Ruiz Davenport, Portland State University
- Presenters Lynn Hart, Georgia State University
Deborah Schifter, Mount Holyoke College
Virginia Stimpson, Mercer Island H.S., Mercer Island, WA
- Discussant Richard Lesh, Educational Testing Service
- Work Session The NCTM *Standards* have implications for changes in the way mathematics is taught. Efforts are underway to help teachers make these recommended changes. This symposium will explore issues pertinent to the documentation of teaching practices that specifically support these recommendations.
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1:30 - 3:00 pm

Davidson A

Fostering Change: Primary Teachers Constructing Meaningful Mathematics Instruction

- Organizer/Presenter Patricia Campbell, University of Maryland - College Park
- Presenter Deborah Carey, University of Maryland - College Park
- Presider/Discussant Martin Johnson, University of Maryland - College Park
- Work Session This session will focus on the nature of teacher change and criteria for evidence of change. Two NSF-funded projects will be briefly described in order to catalyze participant discussion. The projects deal with primary mathematics classrooms in predominantly minority schools.
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1:30 - 3:00 pm

Davidson C

**Toward a Long Term View of Calculus Learning:
From Elementary School to College**

- Organizer/Presenter Ricardo Nemirovsky, Technical Education Research Center
- Presenters Andee Rubin, Technical Education Research Center
Cornelia Tierney, Technical Education Research Center
- Symposium This presentation will describe a program of research and development at TERC whose goals are: to investigate the relationship between the fundamental ideas of calculus and the mathematical intuitions of students from elementary school to college; to explore how those intuitions may support the learning of calculus as part of general mathematics education; to construct and study new technological environments in which students can learn fundamental ideas about change; to develop curricular materials for elementary schools.
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1:30 - 4:45 pm

Ryman North

**Understanding the Relationship Between
Teacher Beliefs and Changes in Practice**

- Organizer/Presenter Julian Weissglass, Mathematical Sciences Educ. Board
- Presenters Beatriz D'Ambrosio, University of Delaware
Barbara Dubitsky, Bank Street College
- Work Session Participants will discuss the need for research on how teachers' beliefs, values, and feeling affect change in the classroom. Issues and research methods will be addressed.
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1:30 - 4:45 pm

Ryman South

**Technological Innovations in Geometry:
Opportunities for Research**

- Organizer** Al Cuoco, Education Development Center & Woburn High School
- Presenters** Jonathan Choate, Boston University & Groton School
Wallace Feurzeig, Bolt, Beranek, Newman, Inc.
Wayne Harvey, Educational Development Center
Gene Stanley, Boston University
- Discussant** Mark Driscoll, Education Development Center
- Work Session** The common theme in all of these presentations is the use of the computer as a visualization tool. Research questions include the extent to which technology makes ideas from advanced mathematics accessible to secondary students and teachers; the impact of computers on connecting geometry to other branches of mathematics and science; and ways in which computers can be used to help students experience dynamic change.
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3:15 - 4:45 pm

Davidson A

**Finding Structure in Diversity:
The Study of Mathematical Behavior**

- Organizer/Presenter** David Clarke, Australian Catholic University
- Discussants** Robert Davis, Rutgers University
Jim Hiebert, University of Delaware
- Thematic Presentation** Research into mathematical learning must employ analytic frameworks which reflect the complexity of mathematical behavior and anticipate the complex learning environments in which we hope to apply our theories. New criteria are proposed by which to assess the adequacy of our datasets and the generalizeability of our conclusions.
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3:15 - 4:45 pm

Davidson B

Research on Novice Teacher Change: Three Longitudinal Studies

- Organizer/Presider** Catherine Brown, Virginia Polytechnic Institute
- Presenters** *Hilda Borko, University of Colorado
Doug Jones, University of Kentucky
Perry Lanier, Michigan State University
Glenda Lappan, Michigan State University
*Penelope Peterson, Michigan State University
*Pam Schram, Michigan State University
Robert Underhill, Virginia Polytechnic Institute
Sandra Wilcox, Michigan State University
Suzanne Wilson, Michigan State University
- Discussant** Edward Silver, University of Pittsburgh
- Research Symposium** Presentations will emphasize issues related to novice teacher change found in three longitudinal studies of novice teacher knowledge, beliefs, thinking, and actions. Facilitators and impediments to reform-oriented change will be discussed.

* indicates speakers

3:15 - 4:45 pm

Davidson C

**Effects of Curriculum Change on
Teachers' and Students' Thinking**
A Research Catalyst Conference Working Group

Organizer/Presenter Patricia Tinto, Syracuse University

Mentor James Hiebert, University of Delaware

Participants Christine Browning, Western Michigan University
Michaele Chappell, University of South Florida
Anna Graeber, University of Maryland
Barbara Shelly, Westhill High School, Syracuse, NY
Martha Wallace, St. Olaf College
Nancy Zarach, Nottingham High School, Syracuse, NY

Thematic Presentation Presenters will address the question, "What can case studies tell us about curriculum change toward the *Standards?*" Issues will be discussed from the perspective of specific case studies on how reform efforts affect teachers' thinking; how teachers' changed thinking affects the way they construct their curriculum and their classrooms; and how students' thinking is affected by the resulting instructional strategies.

5:00 - 6:00 pm

Davidson A

Opportunities for Federal Funding

Presenters Margaret Cozzens, NSF - Materials Development, RTL
Marjorie Enneking, NSF - Teacher Enhancement
Miriam Leiva, NSF - Teacher Preparation
Madeleine Long, NSF - Presidential Awards, SSI,
EPSCORE
Carol LaCampagne, Department of Education - OERI

Wednesday, April 1 1992

8:30 - 10:00 am

Tennessee Room

RAC/SIG-RME /NCSM Joint Session

**Research into Practice: Teachers and
Researchers Working Together**

Presider/Panel Chair Sigrid Wagner, Ohio State University

Panel Margaret Ackerman, Gwin Oaks Elementary School, GA
Gillian Clouthier, North Vancouver School District, B.C.
Robert Jensen, Emory University
Nina Kay Lankford, Monroe Area H.S., Monroe, GA
Douglas Owens, University of British Columbia
Darlene Shandola, Richmond School District, B.C.
Patricia Wilson, University of Georgia

The NCTM Research Interpretation Project has just completed three volumes of *Research Ideas for the Classroom*, in which teachers and researchers have worked together to prepare 52 chapters of research interpretations for early childhood, middle grades, and high school mathematics classrooms. In this session the editors of the volumes and the authors of the teacher-as-researcher chapters will share insights gained from this experience. A special focus of the session will be an opportunity for teachers to suggest to researchers what practitioners would most like to learn from research.

10:30 - 12:30 pm

Nashville West

The Teacher as Researcher

Presider Rose Mary Zbiek, Pennsylvania State University

Speakers Alice Alston, Rutgers University
Lillian Gray, New Brunswick Public Schools, NJ
Judith Landis, Colts Neck Public Schools, NJ
Carolyn Maher, Rutgers University
Amy Martino, Kenilworth Public Schools, NJ & Rutgers

Administrators/Researchers from three New Jersey school districts, urban, suburban, and working class, will describe their own involvement and that of their participating teachers in an NSF funded longitudinal study on the development of mathematical ideas of individual students. Examples of mathematical activities and videotaped excerpts from the actual classroom episodes, as well as videotaped interviews of individual students, will be shared.

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