

# RESEARCH PRESESSION

The 71st Annual Meeting of the National Council  
of Teachers of Mathematics

Monday, 29 March to Wednesday, 31 March 1993

Seattle Sheraton/Convention Center  
Seattle, Washington

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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**Announcements**

The Monday Evening Session will be held in the West Ballroom of the Seattle Sheraton. The Tuesday Sessions will be held in the Convention Center.

Informal gatherings may be held on Tuesday morning in Room 615 and on Tuesday afternoon (3:15 - 4:45) in Room 602.

NOTES: Some sessions are limiting the number of participants. Please check the sign-up sheet at the doors to see if the session of your interest is limiting the number of participants.

In order to preserve the interactive nature of the presession, we ask each organizer to please adhere to the following policy.

**ALL ORGANIZERS SHOULD ALLOW A MINIMUM OF 15 MINUTES PER SESSION FOR GENERAL DISCUSSION.**

**WE ASK THAT EACH ORGANIZER PLEASE ADHERE TO THIS POLICY**

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**Monday, March 29, 1993**

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7:15 - 7:30

West Ballroom (Sheraton)

**Welcome**

Alan Schoenfeld, University of California at Berkeley  
Chair NCTM Research Advisory Committee

Thomas J. Cooney, University of Georgia  
Co-Chair, SIG/RME of AERA

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7:30 - 9:00

West Ballroom (Sheraton)

Speaker: **Gloria Ladson-Billings**  
University of Wisconsin

**Skills and Other Dilemmas Revisited:  
Mathematics and cultural diversity**

What implications do mathematics reform, standards, and assessment have for students of color who have traditionally not performed well in mathematics? Like an earlier reform in literacy (e.g., process writing, whole language), these reforms may prove to be a two-edged sword for African American students. This talk raises questions about how mathematics educators should address issues of equity in the mathematics classroom.

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**A Cash Bar Will Be Held  
in the Cirrus Room (Sheraton)  
Following the Address by Dr. Ladson-Billings**

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**OVERVIEW  
TUESDAY, MARCH 30, 1993**

|          | 9:00 - 10:30  | 10:45 - 12:15  | 1:30 - 3:00  | 3:15 - 4:45  |
|----------|---|--|--|--|
| Room 602 | Open-ended Tasks and Assessment: The nettle or the rose?          | Children's Construction of Fractional Schemes in Computer Microworlds            | A Team Based Approach to Reform in Urban Schools                         | OPEN   |
| Room 617 | Using Data to Build Developmental Schemes for Teachers            | Examining Teacher Change: Models from four research perspectives                 | Inservice Mathematics Teacher Education for Curriculum Reform            | Mathematical Connections --Instances from Research |
| Room 618 | On Learning Abstract Algebra                                      | A Statewide Inservice Project for Implementing the <u>Standards</u> in Algebra I | Future Directions for Research on Gender and Mathematics                 |  |
| Room 603 | Thoughts on Teacher Telling in Constructivist-Influenced Teaching |  | A Bifurcation Point in Algebra Curriculum                                |  |
| Room 616 | Teachers as Researchers: Lessons from the classroom               |  | Developing a Constructivist Learning Environment in High School Geometry |  |
| Room 615 | OPEN  | OPEN   | Using Hypermedia Cases to Study Mathematics Teaching and Learning        |  |

Tuesday, March 30, 1993

9:00 - 10:30 am

Room 602

**Open-ended Tasks and Assessment: The nettle or the rose?**

Organizer/Presenter     David Clarke, Australian Catholic University

Presenter                 Alan Schoenfeld, University of California, Berkeley

Discussant                Phil Daro, University of California

Thematic Presentation     Significant funds and personnel are being committed to the development and implementation of assessment systems employing open-ended mathematics tasks. The session will address the question of whether research supports the use of open-ended tasks for mathematics assessment.

9:00 - 10:30 am

Room 617

**Developmental According to Whom?  
Using Data to Build Developmental Schemes for Teachers**

Organizer/Presenter     Doug Jones, University of Kentucky

Presenters                 William S. Bush, University of Kentucky  
Rebecca B. Corwin, TERC  
Karen Schultz, Georgia State University

Discussant                Thomas A. Romberg, University of Wisconsin

Research Symposium     The participants will discuss strategies and problems in identifying developmental stages through which teachers might go as they change instructional practices. The discussant will comment on the presentations and raise further issues for discussion.

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9:00 - 10:30 am

Room 618

**On Learning Abstract Algebra**

- Organizer/Presenter** Rina Zazkis, Simon Fraser University
- Presenters** Jennie Dautermann, Miami University, Ohio  
Ed Dubinsky, Purdue University
- Discussant** Stephon Monk, University of Washington
- Research Symposium** This symposium will explore undergraduate abstract algebra concepts, the nature of instructional environments that promote those constructions, and specific research techniques that can lead to a fuller understanding of the way students deal with abstract algebra.

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9:00 - 10:30 am, 10:45 - 12:15 pm

Room 603

**Telling in Teaching? Thoughts on Teacher Telling in Constructivist- Influenced Teaching**

- Organizer/Presenter** Daniel Chazan, Michigan State University
- Presenters** Deborah Ball, Michigan State University  
Paul Cobb, Vanderbilt University  
Erna Yackel, Purdue-Calumet University  
Jere Confrey, Cornell University  
John Smith, Michigan State University  
Marcella Perlwitz, Purdue University
- Discussant** Robert Davis, Rutgers University
- Work Session** In this session, we will counterpose telling and constructivist-influenced teaching. The goal is to examine and problematize (a) the forms telling may take in both traditional and innovative constructivist-influenced mathematics teaching; (b) the decisions entailed in moment-to-moment practice that shape telling when teaching mathematics, and (c) students' interpretations of instances of "telling."

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9:00 - 10:30 am, 10:45 - 12:15 pm

Room 616

**Teachers as Researchers: Lessons from the classroom**

- Organizer/Presenter** Patricia Tinto, Syracuse University
- Presenters** J. Michael Shaughnessy, Portland State University  
Barbara A. Shelly, Westhill High School, Syracuse, NY  
Nancy J. Zarach, Nottingham High School, Syracuse, NY  
Starla Manchester, Hough Elementary School Vancouver, WA  
Lani Davidson, Hough Elementary School, Vancouver, WA  
Sandy Detroit, Hallinan Elementary School, Lake Oswego, OR  
Pam Alexander, Welches Middle School, Welches, OR.  
Barabara Olson, River Mill Elementary School, Estacada, OR  
Sue Abrams, West Linn High School, West Linn, OR  
Tricia Stevens, Bend Junior High School, Bend, OR
- Work Session** This session uses case studies of mathematics classrooms to explore the development of teachers as researchers. Interactive thematic groups allow participants, together with presenters, to discuss critical issues, both research and practice, that underlie the development of teachers as researchers.

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10:45 am - 12:15 pm

Room 602

**Children's Construction of Fractional Schemes  
in Computer Microworlds**

**Organizer/Presenter** Leslie P. Steffe, University of Georgia

**Presenters** John Olive, University of Georgia  
Bill Whitmire, University of Georgia  
Denise Spangler, University of Georgia

**Discussants** Merlyn Behr, Louisiana State University  
Guershon Harel, Purdue University

**Thematic  
Presentation** Rather than interfere with the construction of fractional schemes, we show how children can use their number sequences in conjunction with subdivision operations in computer microworlds to construct iterative and measurement fractional schemes. Each scheme type and its construction is illustrated using video-tapes of children along with an analysis of the constructive process.

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10:45 - 12:15 pm

Room 617

**Examining Teacher Change:  
Models from four research perspectives**

**Organizer/Presenter** Kenneth L. Shaw, Florida State University

**Presenters** Lynn Hart, Georgia State University  
Doug Jones, University of Kentucky  
Deborah Schifter, Mount Holyoke College

**Discussant** Barbara Nelson, Education Development Center

**Research  
Symposium** The participants will present different models of teacher change that have resulted from their research with in-service teachers. The discussant will comment on the frameworks and the models.

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10:45 - 12:15 pm

Room 618

**Algebra for Everyone: A statewide in-service project for  
implementing the Standards in Algebra I**

**Organizer/Presenter** Ann R. Crawford, University of North Carolina at Chapel Hill

**Presenters** Hunter Ballew, University of North Carolina at Chapel Hill  
Lynae Sakshaug, North Carolina State University

**Discussant** James Fey, University of Maryland

**Thematic  
Presentation** This session will focus on a statewide effort to implement various aspects of the Standards, particularly with respect to the topic of algebra.

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1:30 - 3:00 pm

Room 602

**The Bank Street Mathematics Leadership Collaboration:  
A Team-Based Approach to Reform in Urban Schools**

Organizer/Presenter Barbara Dubitsky, Bank Street College

Presenters Margaret Honey, Bank Street College  
Naomi Hupert, Bank Street College

Discussants Barbara Nelson, Education Development Center  
Susan Jo Russell, TERC  
Joel E. Schneider, Children's Television  
Workshop

Thematic Presentation Presenters will discuss research designed to evaluate the extent to which the teachers in Bank Street's Mathematics Leadership Collaboration have been able to bring about significant reforms in their classrooms. We will explore the relationship between teachers' changing classroom practices and their ability and credibility as leaders within the larger school community.

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1:30 - 3:00 pm

Room 617

**In-service Mathematics Teacher Education for Curriculum Reform--  
Research Issues**

Organizer/Presenter Harold L. Schoen, The University of Iowa

Presenters Eric Hart, Maharishi International University  
Glen Blume, Penn State University  
Kathy Heid, Penn State University  
Rose Zbiek, The University of Iowa  
Margaret Kenney, Boston College

Discussant Joan Ferrini-Mundy, University of Delaware

Thematic Presentation This session will focus on research issues that are suggested by a recursive/reflective conceptual model for the development of teachers as facilitators of curriculum reform. Presenters represent three different NSF-funded Teacher Enhancement projects that aim to develop teacher leaders.

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1:30 - 3:00, 3:15 - 4:45 pm

Room 618

**Future Directions for Research on Gender and Mathematics**

Organizer/Presenter Joanne Rossi Becker, San Jose State University

Discussants Suzanne K. Damarin, The Ohio State University  
Laurie E. Hart, University of Georgia

Work Session In this work session, participants will discuss what directions future research on gender and mathematics should take. We plan to begin to generate an agenda for future research which utilizes the more general new scholarship on women. Participants will work.

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1:30 - 3:00, 3:15 - 4:45 pm

Room 603

**A Bifurcation Point in Algebra Curriculum**

Organizer/Presenter David Kirshner, Louisiana State University

Presenters Robert Davis, Rutgers University  
Alan Hoffer, University of California at Irvine  
John Richards, BBN Labs

Discussant Jim Kaput, University of Massachusetts

Work Session There is an ongoing concerted and coordinated effort to restructure school algebra. A series of papers and position statements compare the old to the new; not just as practices to be adopted or abandoned, but in terms of their underlying intentions and aspirations.

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1:30 - 3:00, 3:15 - 4:45 pm

Room 616

**Developing a Constructivist Learning Environment in High School Geometry**

Organizer/Presenter W. Gary Martin, University of Hawaii

Presenters Neil Pateman, University of Hawaii  
M. Jayne Higa, University of Hawaii

Discussants Douglas Clements, SUNY at Buffalo  
Helen Mansfield, Curtin Institute of Technology  
Les Steffe, University of Georgia

Thematic Presentation This session will highlight issues and findings related to curriculum development based on a constructivist theory of research, teaching, and learning. The Geometry Learning Project, which is developing a high school geometry curriculum, will provide the major context for discussion.

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1:30 - 3:00, 3:15 - 4:45 pm

Room 615

**Using Hypermedia Cases to Study Mathematics Teaching and Learning**

Organizer/Presenter Deborah Ball, Michigan State University

Presenters Magdalene Lampert, Michigan State University  
Mark Rosenberg, Michigan State University  
Kara Suzuka, Michigan State University  
Ruth Heaton, Michigan State University

Work Session This session will involve using and analyzing hypermedia case materials and tools for inquiry designed by the presenters to portray new approaches to the teaching of mathematics in school. Presenters and attendees will discuss the potential of such materials and tools for doing research on teaching and learning.

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3:15 - 4:45 pm

Room 617

**Mathematical Connections: Instances from research**

Organizer/Presenter Douglas T. Owens, The Ohio State University

Presenters Ann Anderson, University of British Columbia  
Ramakrishnan Menon, University of British Columbia  
Thomas L. Schroeder, University of British Columbia

Discussant Thomas O'Shea, Simon Fraser University

Research Symposium This symposium will explore mathematical connections from four perspectives. The presenters will give implications from their findings dealing with mathematical connectons by focusing on environments which permit or inhibit the establishment and demonstration of these connections.

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**Wednesday, March 31, 1993**

8:30 - 10:00 am

Grand III (Westin)

RAC/SIG-RME/NCSM Joint Session

Speaker: Philip Daro, University of California and the New American Standards Project, Oakland, California

**The New American Standards Project's Mathematics Assessments**

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10:30 am - 12:30pm

Room 305 (Convention Center)

RESEARCH EXTENDED WORKSHOP

Speakers: Susan Jo Russell, TERC, Cambridge, Massachusetts  
Rebecca Corwin, TERC, Cambridge, Massachusetts

**Talking Mathematics in Elementary Classrooms**

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