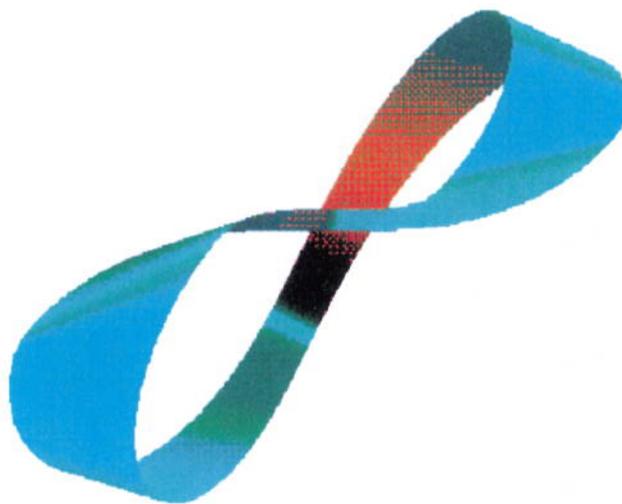


RCMIL

*Cleveland  
2007*

**THE RESEARCH COUNCIL ON MATHEMATICS LEARNING  
34<sup>TH</sup> ANNUAL CONFERENCE**



**THE DESIGN SHOWS THE MERGING NATURE OF RCDPM TO RCML**

**MARCH 1-3, 2007  
CLEVELAND, OH**

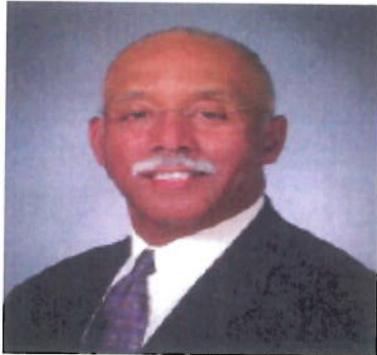
**HOSTED BY: CLEVELAND STATE UNIVERSITY & KENT STATE UNIVERSITY  
COLLEGES OF EDUCATION & HUMAN SERVICES**

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## KEYNOTE SPEAKERS

### Dr. Julian Earls



Dr. Julian M. Earls is Executive in Residence at the Nance College of Business Administration at Cleveland State University in Cleveland, Ohio. Also, he currently serves as Co-Chair of the Science and Mathematics Education Policy Advisory Council for the State of Ohio. In January 2006, he retired from the position of Director of the National Aeronautics and Space Administration's Glenn Research Center (GRC) in Cleveland. As Director of GRC he managed a budget in excess of \$600 million and a workforce of over 3000 employees.

### Dr. Jean Schmittau

Dr Jean Schmittau is a professor of Educational Psychology and Mathematics Learning at the State University of New York at Binghamton. Her areas of expertise and research are in Vygotskian psychology and mathematics education. Dr Schmittau was in Russia at the invitation of the Russian Academy of Pedagogical Sciences where she researched Davydov's mathematics program. She subsequently implemented the Davydov program in a US school setting. Dr Schmittau is currently the lead mathematics educator of a project to improve middle school mathematics in high needs school districts in upstate New York. Dr. Schmittau also serves as the editor of the journal, *Focus on Learning Problems in Mathematics*, the official journal of the Research Council on Mathematics Learning.

# RCML 2007 Conference Schedule of Events

## Thursday, March 1, 2007

Registration	1:00 PM – 4:00 PM
Executive Board Meeting	1:00 PM – 3:00 PM
Reception (2 <sup>nd</sup> Floor Hallway)	4:00 PM – 7:00 PM

**7:00-7:30 p.m.**

**Palace West**

Welcome given by:

**Dr. James McLoughlin**

Dean, College of Education & Human Services  
Cleveland State University

&

**Dr. David England**

College of Education, Health and Human Services  
Kent State University

**Wilson Lecture** **7:30 PM – 8:30 PM**  
**Room: Palace West**

**Dr. JULIAN M. EARLS**

**Things They Don't Teach in College about Mathematics and Science Education**

This presentation will focus upon those intangibles that make teachers more effective in teaching mathematics. What are those intangibles and how are they attained? Although content knowledge is necessary, it is not sufficient for the delivery of mathematics education to students. How does the teacher cause students to motivate themselves to better performance? The presenter submits that inspiration is external and motivation is internal. Who inspires and how is the inspiration achieved? Hopefully, the presentation will start to answer these questions.

## Friday, March 2, 2007

<b>Continental Breakfast</b>	<b>7:00 AM – 8:30 AM</b>
Session 1-5	8:30 AM – 9:15 AM
Sessions 6-11	9:20 AM – 10:05 AM
<b>Coffee Break</b>	<b>10:05 AM – 10:15 AM</b>
Sessions 12-17	10:20 AM – 11:05 AM
Sessions 18-23	11:10 AM – 11:55 AM
<b>Lunch Business Meeting</b>	<b>Noon – 1:30 PM</b>
Sessions 24-29	1:30 PM – 2:15 PM
Sessions 30-35	2:20 PM – 3:05 PM
Sessions 36-41	3:10 PM – 3:55 PM
<b>Coffee Break</b>	<b>3:55 PM – 4:10 PM</b>
Sessions 42-46	4:10 PM – 4:55 PM
<b>Keynote Speaker</b>	<b>5:00 PM – 6:00 PM</b>
<b>Dr. JEAN SCHMITTAU</b>	<b>Room: Palace West</b>

### **Meeting the Challenges to Mathematics Education in the 21<sup>st</sup> Century: Is There a Role for Cultural-Historical Psychology?**

The constructivist reform movement in mathematics education has produced some clearly beneficial results, but has also given rise to some serious challenges from leading voices in the field of mathematics. The recent search for common ground holds promise for resolving the so-called 'math wars', increasing the coherence of the mathematics curriculum, and advancing the mathematical proficiency of U.S. students. Cultural-historical psychology has the power to contribute greatly in this effort, and even to point the way to its accomplishment. We will explore this potential, as well as inhibiting factors to its implementation in U.S. classrooms.

## Saturday, March 2, 2007

<b>Continental Breakfast</b>	<b>7:00 AM – 8:30 AM</b>
Sessions 47-52	8:30 AM – 9:15 AM
Sessions 53-58	9:20 AM – 10:05 AM
<b>Coffee Break</b>	<b>10:05 AM – 10:15 AM</b>
Sessions 59-64	10:20 AM – 11:05 AM
Sessions 65-70	11:10 AM – 11:55 AM
<b>Lunch</b>	<b>12:00 PM – 1:30 PM</b>
Executive Board Meeting	1:00 PM – 4:00 PM

# Friday, March 2, 2007

Continental Breakfast

7:00 AM – 8:30 AM

Session 1- 5

8:30 AM – 9:15 AM

Session 1

Room: Hanna

## **Assessing Major Higher Education Assessment Instruments**

Bea Babbit, University of Nevada, Las Vegas

The national accountability discussion has been extended from K-12 to K-16. Despite the problems generated by NCLB assessment approaches, many higher education accountability proposals also focus on the use of national standardized tests. This session will compare and contrast the content and test properties of three major standardized assessment instruments purported to assess undergraduate student learning: CAAP, MAPP, and CLA. Mathematics/problem solving content will be highlighted.

Session 2

Room: Roxy

## **Mathematics Disposition of Pre-service Teachers: A Comparison of Beliefs**

Nancy Cerezo, Saint Leo University

Monika Vo, Saint Leo University

Valerie Wright, Saint Leo University

Carol Walker, Saint Leo University

Sylvia Rockwell, Saint Leo University

What do pre-service teachers say about teaching mathematics in the classroom? Is there a difference in dispositions and self-efficacy between pre-service teachers who did not learn math according to the 1989 NCTM standards and those who did? Visit the presentation to learn more about this start-up project.

Session 3

Room: Embassy

## **Mathematical Concepts Related to Environmental Critical Literacy**

Mary Gove, Cleveland State University

Denis Sebian, Environmental Engineer and Researcher

This presentation is a call for an interdisciplinary collaboration between mathematics educators and literacy educators to explore a teacher professional development module for mathematics concepts applicable to Ecological Critical Literacy (ECL). ECL is a literacy strategy that introduces concepts around humanity's impact on the environment into content teaching, such as mathematics education.

This session will be interactive; the presenters will lead participants in a dialogue concerning ECL mathematics component.

Session 4 Room: State  
**Factors That May Increase Mathematics Content Knowledge**  
Carolyn Pinchback, University of Central Arkansas

A brief overview will be given about this project, The UCA/School Districts P-16 Education Partnership for Improving Teacher and Principal Quality No Child Left Behind: Part III-2006-2007. Based upon the teachers' responses, the speaker will identify the factors affecting mathematics learning in their classroom and the effects of using strategies recommended by two educators.

Session 5 Room: Ohio  
**Mentoring Teachers with Student Work Samples**  
Sally Robison, University of Arkansas – Little Rock

The use of mentoring and the collection of work samples with identified student misconceptions were used as springboards for professional development workshops that improved content knowledge and instructional techniques.

**Sessions 6-11** 9:20 AM – 10:05 AM

Session 6 Room: Hanna  
**Ratio Triplets**  
Keith Adolphson, Eastern Washington University

What mathematical connections can students make when asked to explore a common ratio task that is posed three different ways? After describing the three versions, I'll profile some of the different mathematical thinking that students demonstrated and highlight the benefits of in having students discuss all three versions.

Session 7 Room: Roxy  
**Assessing a Collegiate Summer Academy for Students Rising to Grades 8-10**  
David Boliver, University of Central Oklahoma  
Rocky Bargas, Cheyenne Middle School, OK

A review of the long-term success of a college intervention program in mathematics for promising teenage youth.

Session 8 Room: Embassy  
**Mathematics! Algebraic Reasoning for Teachers and Students**  
Angela Krebs, University of Michigan -- Dearborn  
Kathy Burgis, Aquinas College  
Nan Jackson, Lansing Community College

The role of algebra in the curriculum has changed over the past few decades. This session will examine how we can better prepare teachers to effectively teach the algebra of the current middle grades curriculum. We will share our work, discuss preliminary findings, and solicit feedback.

Session 9

Room: State

**The Attitudes and Beliefs of African American Students and their Parents toward Algebra: Further Investigation**

Belvia Martin, Lomond Elementary School, OH

Roberta Kalich-Paley, Lomond Elementary School, OH

This study seeks to examine the thoughts of parents and students as they consider the necessity and uses of higher mathematics, specifically algebra. More and more, the need for higher mathematics is evident in the world around us. However, for some, mathematics beyond simple calculation is puzzling, frightening, incomprehensible and downright unnecessary. A question must be raised in light of the poor showing in mathematics performance of many students of color in higher mathematics: What is the need for these higher mathematics procedures in the lives of many of our African American students today? Robert Moses (2002) has made the case that they are very important in the lives and futures of these students. He even equates the acquisition of this mathematical knowledge as part of their civil rights. True as this may be, for many, this acquisition is not happening. What is the vision of the uses of mathematics in the daily or professional lives of many African Americans? Do students of color recognize a context for the use of algebra, or does it simply seem unnecessary? The presentation will continue to explore some of these issues. The conference participants will have opportunities to discuss their experiences regarding the questions stated above.

Session 10

Room: Ohio

**Developing Grades 1-8 Math Skills with Crossword Puzzles**

Michael Naylor, Western Washington University

Kids have been successfully using supplemental math crossword puzzles to help develop grade-level skills and meet grade level expectations. We will discuss the design of these puzzles and their effect on students' attitudes and test scores.

Session 11

Room: Allen

**It's a Year Seven: The Professional Journey Continues**

Kay Wohlhuter, University of MN Duluth

This session will describe a middle school mathematics teacher's journey as a professional from the time of her mathematics methods class through her seventh year of teaching. What factors influenced her development? What are the implications for teacher education?

**Sessions 12-17**

**10:20 AM – 11:05 AM**

Session 12

Room: Hanna

**One View of the Terrain of Education and Mathematics in South Carolina: School Choice and Ability Tracking**

Meghan S Che, Clemson University

Discusses one perspective of the structure of mathematics education in South Carolina, and invites participants to share their local and regional school structures in mathematics education. What are your thoughts about ability tracking? Could magnet schools in South Carolina be related to equity? What does inclusion mean in mathematics classrooms?

Session 13

Room: Roxy

**Student Coursework, Achievement and College Readiness**

Robert Mann, Western Illinois University

The ACT organization has established a link between college readiness in mathematics for secondary students and the level of mathematics' courses they complete in high school. The research presented in this talk focuses on a similar trend in Illinois regarding the link between secondary coursework in mathematics and student achievement on the Prairie State Achievement Exam as well as general college-readiness in mathematics. Four-year data from 11 schools in Illinois is used to establish trends in coursework, assessment scores, and college-readiness.

Session 14

Room: Embassy

**Middle School Mathematics Academy: Results of Teachers' Study of Student Work**

Jean McGehee, University of Central Arkansas

University mentors from a middle school mathematics academy will present scripted examples of middle school teachers' study of student work, the impact of the teachers' discussions on their practice, and student achievement data from the three years of this professional development project.

Session 15

Room: State

**Social Constructivism in Practice: A Reflection on 10 Years of Reform**

Roland Pourdavood, Cleveland State University

Lynn Cowen, Onaway Elementary School, OH

This report focuses on ten years effort for reforming mathematics teaching/learning in a K-4 school. It suggests that helping all children to learn mathematics may require restructuring and reculturing schools. Moreover, it argues that fitting inquiry-based mathematics into traditional school schedules and school environments may produce frustration and disappointment until new teaching/learning climates and new time schedules are designed.

Session 16

Room: Ohio

**Facilitating Mathematical Conversation Through Quick Draw**

Kerri Richardson, University of North Carolina – Greensboro

In consideration of an epistemology that relies on complexity theory, I offer one way to engage preservice teachers in a different type of mathematical conversation. The type of conversation allows for multiple perspectives. In this paper, I describe a classroom activity called Quick Draw and how it facilitates mathematical conversation.

Session 17

Room: Allen

**Exploring Preservice Elementary Teachers Fraction Sense**

Juliana Utley, Oklahoma State University

Stacy Reeder, University of Oklahoma

Can elementary teacher candidates “unlearn” harmful algorithms used with fractions as they are invited to develop fraction number sense? This study examines the development of elementary teacher candidates' fraction number sense during an intermediate mathematics methods course. During this course, participants were involved in a variety of activities and tasks used for the development of fraction number sense. The findings of this research can be used to inform curriculum developers and mathematics instructors in the development of reform-based mathematics content courses for elementary school teachers.

## Session 18

Room: Hanna

**Assessment of the Mathematics Teaching of Elementary Preservice Teachers during Student Teaching**

Dana Craig, University of Central Oklahoma

This presentation will share responses of surveys from three student teaching semesters. Supervisors and mentors were surveyed about the teaching of mathematics by elementary student teachers. These student teachers had completed twelve hours of mathematics content and six hours of mathematics pedagogy in undergraduate work. Discussion of possible implications will follow presentation of results.

## Session 19

Room: Embassy

**Middle School Mathematics Academy: Analysis of Students' Reflective Journals**

Donna Foss, University of Central Arkansas

In a professional development project for middle level mathematics teachers, the analysis of their reflective journals and teaching observations demonstrates the extent to which their instructional behaviors exemplify the focus on content knowledge, delivery strategies, and standards-based curricula. Results include new teaching strategies that meaningfully engage students.

## Session 20

Room: Roxy

**GEOSet Effect on Student Attitudes and Beliefs**

Luke Foster, North Eastern State University

Darlinda Cassel, University of Central Oklahoma

GEOSet is an acronym which stands for Geometric Structures for Elementary Teachers, a 3-year project funded by the NSF and awarded to the Mathematics Department at Oklahoma State University. This paper describes research conducted to determine what effect GeoSET curriculum has on attitudes of prospective geometry students regarding mathematics learning.

## Session 21

Room: State

**Informal Forum: Fostering active learning**

Dr. Grace Hui-Chen Huang, Cleveland State University

*Informal Forum*, grounded in constructivism has been developed to foster active learning and deep understanding. Learning is an interdependent process, and is most effective when students construct their own meaning of knowledge. If one believes in the value of constructivist learning, it is important to teach how we preach in higher education. This activity consists of three phases of learning procedure, including *preparing* students for the forum, *staging* the classroom forum, and *reflecting* on the forum activity. The tasks in each phase will be explained and examples will be provided. In this activity, students demonstrate high levels of cognitive thinking in which peer teaching is evident and deeply embedded through dialogue among participants. Informal Forum successfully helps students learn about child development theories and other contents in a teacher preparation program. The results of students' learning were revealed through their own reflections right after the forum.

Session 22

Room: Ohio

**Exploring Atypical Errors to Uncover Student Thinking**

Dr. Diana Perdue, Virginia State University

The purpose of this presentation is to involve participants in small-group problem solving. As experienced teachers know, we come to expect certain types of errors from our students when we ask various assessment items. It is with interest, therefore, when we see error patterns that are atypical or unusual because it causes us to examine our teaching in order to ascertain where the student "picked up" the (mis)information they present in their work. In this cooperative presentation, participants will be asked to join with me in examining student work to hypothesize about causes and to compile follow-on questions that will improve future instruction and mathematics learning.

Session 23

Room: Allen

**Mathematical Autobiographies: The Stories of Preservice Teachers**

Elaine Young, Texas A&M University - Corpus Christi

Mathematical autobiographies of preservice elementary teachers give light to affective factors which may influence mathematical learning as well as their ability.

**Lunch Business Meeting**

**Noon – 1:30 PM**

**Palace East  
Business Meeting Agenda**

Welcome  
Report of the Secretary  
Approval of the Posted 2006 Minutes  
Report of the Treasurer  
Report of the Membership  
Report of the Past President  
Report of the Vice President for Conferences  
Conference 2008  
Report of the Vice President for Publications

**Sessions 24-29**

**1:30 PM – 2:15 PM**

Session 24

Room: Hanna

**Funforms, a second mathematical language to facilitate understanding of our own**

Joel Steinberg, Case Western University

Attendees will be introduced to a new symbolic system, making operations transparent and further clarifying the relationship of fractions to whole numbers. This is akin to learning a foreign language. It offers a vantage point to more clearly understand your 'native language', in this case, our own numbering system.

Session 25

Room: Allen

**Sculpting Middle School Math Teachers: An Action Research Venture**

Sheryl Maxwell, University of Memphis

This session highlights a mathematics educators' journey and progress as she designs and implements a reinvented mathematics methods course within a teacher preparatory program. Insights coalesced from several data sources will be shared. Seeds of visionary design are sown through discourse opportunities about troublesome barriers and successful mathematics reform efforts.

Session 26

Room: Roxy

**Gender & Language Use in Parent-Child Dyads Working on Mathematical Tasks**

Judith Olson, University of Hawai'i  
Clarie Okazaki, University of Hawai'i  
Melfried Olson, University of Hawai'i

This presentation will report on the status of a three-year NSF grant and include: design and methodology; evolution of math tasks based on piloting; the development of the surveys; and discussion of video data collected as well as the processes for the coding structure planned for the analysis of video.

Session 27

Room: Embassy

**An Investigation of the Use of Fourth Graders' Language to Solve Math Problems**

Ann Rule, Saint Louis University  
Martha Brennan, Saint Louis University  
Angela Walmsley, Saint Louis University

An examination of language and problem solving strategies that fourth graders used during a think-aloud process to solve grade level math problems will be discussed. Variables included number and types of events used. Results that have implications for teachers will be presented.

Session 28

Room: State

**Uncovering Teacher Decisions About Using Technology to Teach Mathematics**

Marcia Weller Weinhold, Purdue University -- Calumet

What do teachers consider when they make decisions about using technology to teach mathematics? Design experiment methodology focuses teacher work on a shareable document, and thus provides a way to bring out issues while avoiding personal confrontation, while providing rich transcripts by which to track development of the tool.

Session 29

Room: Ohio

**Pre-Service Teachers Experience Project-Based Mathematics**

Jennifer Wilhelm, Texas Tech University  
Sonya Sherrod, Texas Tech University  
Kendra Walters, Texas Tech University

Six groups of pre-service teachers (PSTs) conducted project work that required the mathematization of the sky. PSTs had difficulties developing the mathematics needed to conduct this unfamiliar task of project work. With the assistance of benchmark lessons for guidance, PSTs emerged with unique representations and models of a mathematized heaven.

**Sessions 30-35**

**2:20 PM – 3:05 PM**

Session 30

Room: Roxy

**Conceptualizing Limits of Sequences**

Beth Cory, Sam Houston State University

This session focuses on preservice teachers' understanding of limits and how interactive dynamic sketches can deepen their understanding of the formal definition of the limit of a sequence. Preservice teachers' misconceptions about limits, their interactions with the sketches, examples of growth, and teaching implications will be discussed.

Session 31

Room: Embassy

**Constructivism as a Theoretical Framework in Science Education**

Robert Ferguson, Cleveland State University

Constructivism, a theory of learning, describes how a learner incorporates knowledge into existing mental structures. Science education researchers have applied constructivism as theoretical framework to describe how people make sense of various phenomena. Consistent with the methodologies set forth by Lincoln and Guba (2000), various research design strategies and methods have emerged. This session will highlight different examples found in the literature.

Session 32

Room: State

**Helping Students Develop Self-Assessment**

Sally Mascia, Cleveland Municipal School District

This session will examine the different strategies used for improving student learning and compare their effect sizes. Then using this research, the session will provide an experience of a way to use the strategy that is shown most effective with students in the classroom.

Session 33

Room: Hanna

**Project Jumpstart: Junior Undergraduate Placement Survey Test and Reflection Tool**

William Speer, University of Las Vegas – Nevada

The JUMP START test emphasizes the benefits of rigorous mathematics study during the senior year. Resembling a university mathematics placement test, JUMPSTART is used to predict college readiness at the time the test is taken. One goal of JUMP START is to reduce the number of freshmen students enrolled in remedial courses.

Session 34

Room: Ohio

**Reflective Tutoring: Developing Children's Mathematical Power**

Dr. Sheryl Stump, Ball State University

This session will describe a course designed to help preservice teachers develop knowledge and skills for diagnostic instruction. Research addressed the following questions: What did preservice teachers learn about mathematics? What did they learn about learning, teaching, and assessing mathematics? In particular, what did they learn about diagnostic instruction?

Session 35

Room: Allen

**Gender and Anxiety as Variables Related to Attitudes Toward Mathematics**

Martha Tapia, Berry University

Carla C. Moldavan, Berry University

This study examined the effect of gender and mathematics anxiety on self-confidence, value, motivation and enjoyment of mathematics as factors of attitudes toward mathematics. Subjects were students at a private liberal arts college. Multivariate analysis revealed significant effect of gender on value and of mathematics anxiety on all four factors.

~~Session 36~~ ~~Room: Hanna~~

~~**Early Childhood Perceptions of Spatial Awareness in Teachers of Young Children**~~

~~Sally Blake, University of Memphis~~ **Session Cancelled**

~~This session explores early childhood teachers understanding of 3-dimensional measurement approaches and how they perceive their abilities to teach this topic to young children. Serious mathematics reform must begin with the first teachers of children.~~

Session 37 Room: Roxy

**Changing Teachers' Practices: Altering the Focus Away From Computation**

Bob Drake, University of Cincinnati

A three year effort to change the instructional focus in mathematics towards one of developing mathematical understanding was undertaken in a small, low SES school district. The results describe the difficulties and ultimate success of this effort, resulting in significantly positive gains in student scores.

Session 38 Room: Embassy

**Why Do I Need Math?**

Dixie Metheny, Montana State University -- Billings

Many students are not motivated to learn mathematics and will not be mathematically literate in making financial choices. This session will investigate activities that have been used with students in grades seventh through twelve to help them realize the importance of learning about financial topics.

Session 39 Room: State

**Geometry for Middle School Teachers**

Carol Phillips-Bey, Cleveland State University

This will be an interactive session allowing participants to do a geometry activity normally presented to prospective middle school mathematics teachers.

Session 40 Room: Ohio

**Access and Equity in Mathematics Education**

Roland Pourdavood, Cleveland State University

Patrick Wachira, Cleveland State University

Raymond Skitzki, Shaker High School

This study focuses on 11<sup>th</sup> and 12<sup>th</sup> grade students' beliefs and attitudes towards mathematics learning. One of our major goals of this research study is to understand and interpret students' mathematical dispositions and how these can be sustained and advanced as they take more challenging mathematical courses. The primary research questions are: (1) what is the relationship between mathematical discourse and students' mathematical dispositions (2) How may students' mathematical dispositions be sustained and advanced as they take more challenging mathematics courses?

Session 41

Room: Allen

**The State of State-Level Mathematics curriculum Standards: Consensus or Confusion?**

Barbara Reys, University of Missouri

This presentation reviews the findings of an analysis of 42 state-level K-8 mathematics curriculum standards. Similarities and differences in the grade placement and emphasis of topics from the number and operation strand will be highlighted.

Sessions 42-46

4:10 PM – 4:55 PM

Session 42

Room: Hanna

**History of the Underrepresented in Mathematics: Women of ENIAC**

James Murphy, Cleveland State University

The juxtaposition between advancement in numerical calculations brought about by the computer and advancement of women's roles in mathematics brought about by their contribution to computer technology is discussed. The careers of Betty Holberton who advanced common computer language and Grace Murray who first envisioned common language programming are highlighted.

Session 43

Room: Roxy

**Content and Teaching Strategies in a Course for Middle School Teachers**

Ieda Rodrigues, Cleveland State University

The talk is an overview of the mathematical content and objectives of a course for middle school teachers based on calculus ideas. It is based on the six week intensive course that runs at Cleveland State University in the summer of 2006. The presenter will report on how cooperative learning strategies and graphing calculators helped shape the course.

Session 44

Room: Embassy

**Exploring K-3 Teachers' Beliefs about Teaching and Learning Mathematics**

Joyce H. Swan, University of Tennessee, Martin

Because teachers' beliefs have been shown to be highly influential in what and how they teach, and thus impact student achievement, the data from this research will add to previous findings regarding teachers' beliefs. Early childhood teachers in West Tennessee were surveyed with a revised version of the mathematics beliefs scale (Capraro, 2005). A response rate of 175 per strata (four population groupings) was targeted. Currently, 2/3 of that goal has been met. This research is still in progress, but all data collection and analysis should be complete by the date of the RCML meeting.

Session 45

Room: State

**Preparing Pre-service Teachers to Teach Mathematics in Inclusive Classrooms**

Tony Thompson, University of Alabama

Course activities and field experiences designed to prepare pre-service teachers for teaching mathematics to students with special needs will be presented. Data will also be discussed regarding the effectiveness of these activities on improving pre-service teachers' knowledge of, attitude toward, and confidence in teaching mathematics in inclusive classrooms.

Session 46

Room: Allen

**Introduction to Teaching: A Pilot Pre-Methods Course for Math Majors**

Daniel Brahier, Bowling Green State University

We will discuss the components of a new course that was developed for sophomore teacher candidates in secondary mathematics education. In the course, students explore both mathematics content and pedagogy in an introduction to the field. Student reactions to a pilot of the course and its implications will be discussed.

**Keynote Speaker**

**5:00 PM – 6:00 PM**

**Meeting the Challenges to Mathematics Education in the 21<sup>st</sup> Century: Is There a Role for Cultural-Historical Psychology?**

Jean Schmittau, State University of New York - Binghamton

The constructivist reform movement in mathematics education has produced some clearly beneficial results, but has also given rise to some serious challenges from leading voices in the field of mathematics. The recent search for common ground holds promise for resolving the so-called 'math wars', increasing the coherence of the mathematics curriculum, and advancing the mathematical proficiency of U.S. students. Cultural-historical psychology has the power to contribute greatly in this effort, and even to point the way to its accomplishment. We will explore this potential, as well as inhibiting factors to its implementation in U.S. classrooms.

**Saturday, March 3, 2007**

**Continental Breakfast**

**7:00 AM – 8:30 AM**

**Sessions 47-52**

**8:30 AM – 9:15 AM**

Session 47

Room: Allen

**Sharing Research Results From a Middle School Geometry Grant**

Darlinda Cassel, University of Central Oklahoma

Juliana Utley, Oklahoma State University

Stacy Reeder, University of Oklahoma

Research will be presented that resulted from geometry workshops designed for middle school geometry teachers to enhance teacher quality and improve student outcomes.

Session 48

Room: Roxy

**Improving the Knowledge & Skills of Middle School Math Teachers & Students**

Tony Hecimovic, Montana State University-- Billings

David Davison, Montana State University -- Billings

Final results will be presented from a project in which the institute of higher education partnered with a local district to help middle school math teachers become highly qualified.

Session 49

Room: Embassy

**Mathematics Cognition: Revisiting Piaget's Conservation Tasks**

Patricia Lamphere Jordan, Oklahoma State University

This study has two facets. The first is a review of ways in which the conservation tasks have been reported in research over the past thirty years. The second is a report of the findings of a single subject study of a first grade boy and an interpretation of his responses to a series of conservation tasks.

Session 50

Room: State

**An Examination of the Development of Rational Number from a Measurement Context**

Melfried Olson, University of Hawai'i at Mānoa

Hannah Slovin, University of Hawaii at Manoa

Fay Zenigami, University of Hawai'i at Mānoa

Claire Okazaki, University of Hawaii at Mānoa

This presentation will discuss children's understanding of rational number concepts including their struggle to mesh conceptual work in a measurement context [area & length] with algorithmic models learned outside of school. Primary discussion will focus on the meaning of rational number, equivalent forms of representation, equivalent fractions and fraction addition.

Session 51

Room: Ohio

**The Effects of Teachers' Presentation on Middle School Algebra Students' Engagement and Understanding.**

Amanda Ross, Independent Researcher

This study examined the effects of teachers' presentations of lessons, involving representations and constructivist approaches, on middle school algebra students' subsequent engagement and conceptual understanding. The presence of enactive representations, problem-centered lessons, and student engagement revealed increased student understanding, as evidenced by discursive reasoning and test score gains.

Session 52

Room: Allen

**Elementary Mathematics Lessons: In-service Activities with Teachers**

Sandra Davis Trowell, Valdosta State University

This presentation will discuss on-going activities that take place with groups of elementary teachers as they meet regularly to participate in mathematics problem solving. The approach taken as well as the activities to which the teachers best responded and encouraged them to consider their students' thinking will be discussed.

**Sessions 53-58**

**9:20 AM – 10:05 AM**

Session 53

Room: Hanna

**Questions One Teacher Asks to Probe Student Learning**

Darlinda Cassel, University of Central Oklahoma

Anne Reynolds, Kent State University

Research from a second-grade problem-centered mathematics learning environment reveal interesting teacher questions.

Session 54 Room: Roxy  
**MSP Mathematics Content Courses and Teachers' Mathematical Knowledge for Teaching**

Jodelle Magner, State University of New York – Buffalo

The goal of this session is to inform participants about development of teachers' mathematical knowledge for teaching through content coursework and implementation of standards-based curricula in their own classes. The participants are 3<sup>rd</sup> – 12<sup>th</sup> grade teachers in the NYS Buffalo Public Schools, a high-need urban district.

Session 55 Room: Embassy  
**Developing a Concrete Understanding of Number Bases for Pre-service Educators**

Winifred A. Mallam, Texas Woman's University

During lecture, pre-service educators have been using base 10 blocks to develop concepts and skills at the concrete level. The current study used that background to teach conversions and calculations with other number bases. Results of pre-and post-test scores for the pre-service educators will be shared.

Session 56 Room: State  
**How Should a National Conference on Doctoral Programs in Mathematics Education be Organized?**

Robert Reys, University of Missouri

Ideas for a future National Conference on Doctoral Programs in Mathematics Education will be shared and suggestions for issues/ideas to be included will be solicited.

Session 57 Room: Ohio  
**Children's number concepts: Cognition, Math education, and Disability perspectives**

Elizabeth Sieminski, University of Delaware

Researchers from cognitive sciences, mathematics education, and learning disabilities have been exploring children's understanding of number and arithmetic from (at least) three different perspectives. I am in the process of reviewing the results of recent research in these fields and synthesizing the findings. Based on this synthesis and an analysis of the underlying cognitive and conceptual components of number, I am developing an interview instrument that I plan to use to explore children's numerical understandings. I am particularly interested in learning how children who perform well and those who have great difficulties with early school mathematics, think numerically and quantitatively. In an interview study, I am piloting tasks with the goal of revealing in more detail children's understanding of number concepts as well as their cognitive competencies on more fundamental quantitative and comparative tasks.

Session 58 Room: Allen  
**Mathematics Vocabulary: An Intentional Approach for ALL Language Learners**

Mary B. Swarthout, Sam Houston State University

While language has been an important focus area in helping support ELLs in learning mathematics, ALL students are learners of mathematical vocabulary and language. This session will share strategies from work with ELLs that can help teachers be more intentional about the teaching of mathematical vocabulary and language as an integral part of the content to benefit all mathematics learners.

Session 59

Room: Hanna

**Emerging Pedagogical Issues When Transitioning from Industry to Teaching: A Case Study**

M. Lynn Breyfogle, Bucknell University

In order to provide "highly qualified" mathematics teachers, more and more school districts are turning to professionals from industry to fill the need. Many of these people transitioning from industry have had little to no formal training in pedagogy or knowledge of educational theories. In these situations, what issues arise for these new teachers? What is it that they find most difficult? What information or experiences could assist in this transition? What might we do as mathematics teacher educators to fill this need? Aspects of the experience, research methodology, and preliminary results of an on-going case study working one-on-one with a 9-year veteran Chemist as he teaches his first year of middle school mathematics will be shared. Comments, feedback, and suggestions will be welcome regarding this line of research and the way it is carried out.

Session 60

Room: Roxy

**Mathematics is Culture-free; Really?**

David M. Davison, Montana State University-Billings

Johanna Mitchell, Montana State University-Billings

Many educators assert that mathematics is culture-free, and cite as evidence that  $2+2=4$  always. The presenters claim that mathematics cannot be studied apart from its historical and social contexts, especially if reluctant learners are to be reached.

Session 61

Room: Embassy

**Teacher Openings: Emergence of a Learning Community among Middle School Mathematics Teachers**

Gabriel Matney, University of Arkansas at Fort Smith

The paper and presentation will give the research results of a study that involved 20 middle school teachers from 7 different districts within a 50 mile radius. These teachers committed to a two week summer institute geared toward a) increasing their mathematical knowledge of geometry and b) understanding the relationship between mathematical knowledge and pedagogy. During the institute the PI was given the charge of teaching these 20 teachers content in geometry. This task was enfolded in another task to bring to the fore fray open discussion about that teaching. Pedagogically the teachers were challenged by the use of video cases to examine both mathematical content and pedagogical issues in real classrooms while reflecting on their own teaching. At the close of the institute the teachers were each given a video camera and a tripod to video their own classroom and bring them back to the group to be reviewed. The research findings that will be presented will come from researcher notes, teacher reflections, interviews, surveys, and time warranting, some videos.

Session 62

Room: State

**Elementary Pre-Service Students Thoughts about Teaching & Learning Mathematics**

Rebecca Nelson, Longwood University

Examine findings of surveys given to students who are enrolled in mathematics courses designed for pre-service elementary teachers. The data focuses on the students' perceptions of the process of teaching mathematics at the elementary level and the content of elementary mathematics.

Session 63

Room: Ohio

**Linking a Component of Academic Success in Developmental Mathematics to Non-content matters**

Jerry Obiekwe, University of Akron

The Learning and Study Strategies Inventory (LASSI), which is used in assessing students' learning and study skills, has three well established models in the literature. Each of these models was evaluated with two predictors and a dependent variable, and in each case they strongly suggest academic success for students. The implications of this study will be discussed.

Session 64

Room: Allen

**University of Chicago School Math Project: Achievement and Implementation**

Denisse Thompson, University of South Florida

The University of Chicago School Mathematics Project field-tested its revised Transition Mathematics and Algebra curricula during the 2005-2006 school year using matched pairs of classes in study schools. Information from students and teachers was collected related to implementation and achievement. Lessons learned from the field study will be shared.

Sessions 65-70

11:10 AM – 11:55 AM

Session 65

Room: Hanna

**The Role of Children's Mathematical Thinking in Knowledge for Teaching**

David Feikes, Purdue North Central University

The role of children's mathematical thinking in preservice elementary teachers' learning of mathematics is examined. Qualitative and quantitative research will be presented on how using such an approach influences students' knowledge and beliefs.

Session 66

Room: Allen

**Exploring How Outreach and Motivational Strategies May Impact Learning Math**

Lawrence Lesser, University of Texas at El Paso

How might the use of culturally-relevant mathematics, social justice mathematics, counterintuitive examples, or outreach forms of mathematics (e.g., humor, song, "Pi Day") impact mathematics learning, and how might this best be assessed and researched? We will share and discuss various resources, examples, insights and issues.

Session 67

Room: Roxy

**Professional Development of High School Math Teachers through Team Teaching**

Ramakrishnan Menon, Cal State - Pomona

A team teaching model, where one member of each pair in the team was replaced each time a different class was taught the same math topic, over a period of one day, is discussed.

Session 68

Room: Embassy

**Concept Mapping as an Instructional Tool in Introductory Statistics**

Dawn-Marie Trehan, Kent State University

Concept mapping has enjoyed prominence in science education, but is only recently gaining attention in mathematics education, with very little emphasis in the area of statistics education where the focus is mainly on concept mapping as an assessment tool. This paper proposes the implementation of concept mapping as an instructional tool for introductory statistics at the undergraduate and graduate level. Specifically, this paper discusses how concept maps, when used in addition to established instructional strategies, may help students to organize, revise, and refine their understanding of introductory statistical concepts, their uses and relationships.

Session 69

Room: State

**Expectations of Alternate Route to Licensure Students Taking Math Methods**

Virginia Usnick, University of Las Vegas - Nevada

Marilyn Sue Ford, University of Las Vegas-Nevada

Project compares the expectations and expertise of individuals in an alternative route to licensure with those in a more traditional program.

Session 70

Room: Ohio

**Teachers Seeking Wisdom: Correlations of Teachers' Lessons to State Curriculum & Tests**

Alan Zollman, Northern Illinois University

Approximately 40 upper elementary and middle school teachers correlated the mathematics they actually taught (enacted curriculum) with what the state learning standards require, and with what content is on the state's high-stakes tests. This identified "holes" in their enacted classroom curriculum. After one year, the teachers again correlated their enacted curriculum to the learning standards and state assessment. The results identify what changes did and changes did not occur.

**Lunch**

**12:00 PM – 1:30 PM**

**Executive board meeting**

**1:00 PM – 4:00 PM**