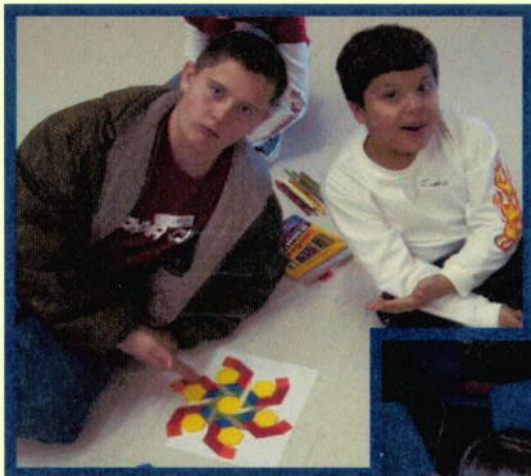


35th Annual Meeting of the
Research Council on Mathematics Learning



Mathematics For All

March 6-8, 2008
Oklahoma City, Oklahoma

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35th Annual Conference of the Research Council of Mathematics Learning Schedule of Events

Thursday, March 6, 2008

Registration	1:00 pm – 6:00 pm
Executive Board Meeting (Pueblo)	1:00 pm – 5:00 pm
Reception	5:00 pm – 6:30 pm
Keynote Speaker	6:30 pm – 7:30 pm
<i>Meaningful Mathematics for All Students: The Place of Imagery</i> by Anne Reynolds	

Friday, March 7, 2008

Continental Breakfast	6:30 am – 10:30 am
Registration	8:00 am – 5:30 pm
Sessions 1 – 6	8:30 am – 9:15 am
Session 7 – 12	9:30 am – 10:15 am
Sessions 13 – 17	10:30 am – 11:15 am
Lunch & Business Meeting	11:30 am – 1:15 pm
Sessions 18 - 23	1:30 pm – 2:15 pm
Sessions 24 – 29	2:30 pm – 3:15 pm
Break – Refreshment	3:15 pm – 3:40 pm
Sessions 30 – 35	3:40 pm – 4:25 pm
Sessions 36 – 41	4:40 pm – 5:25 pm

Saturday, March 8, 2008

Continental Breakfast	6:30 am – 10:30 am
Registration	8:00 am – 11:00 am
Sessions 42 – 46	8:30 am – 9:15 am
Sessions 47 – 51	9:30 am – 10:15 am
Sessions 52 – 56	10:30 am – 11:15 am
Wilson Lecture	11:30 am – 12:30 pm
<i>Adages by Alan: Advice for Living</i> by Alan Jones	
Lunch	12:30 pm – 1:30 pm
Executive Board Meeting (Pueblo)	1:30 pm – 4:30 pm

Thursday, March 6, 2008

Reception

5:00 pm – 6:30 pm

Adobe and Phoenix Rooms located in the Conference Center

Keynote Speaker

6:30 pm – 7:30 pm

Adobe and Phoenix Rooms located in the Conference Center

Meaningful Mathematics for All Students: The Place of Imagery

presented by

Anne Reynolds
Associate Professor, Mathematics Education
Kent State University

Even before the press of No Child Left Behind legislation the mathematics education community, through documents like NCTM standards (1989, 2000) envisioned all students learning important mathematics with understanding. In this talk, I will examine the implications of this vision, focusing in particular on the place of imagery in the mathematical sense making activity.

Friday, March 7, 2008

Overview of Friday Morning Sessions			
	8:30-9:15	9:30-10:15	10:30-11:15
Mesa	1. Geometry and Measurement: Measuring Teachers' PCK and its Effect on Student Achievement - Manizade	7. Funforms, A New Math Learning System - Steinberg	13. Preservice Teachers' Comments About Algorithms - Pinchback
Patio	2. What do you remember? - Turner & Soltani	8. Boys' and Girls' Problem-Solving Strategies in Single-Gendered Classrooms - Che	14. Algebra by any means necessary: Second graders learn the basics - Martin
Navajo	3. Students' Experiences Symbolizing and Communicating in the Algebra Classroom - James	9. Family Math Nights – serving families, schools, and preservice teachers - Young	15. Journaling through a Professional Development Journey - Foss
Executive Suite	4. A Professional Development Model: Working with 6th grade Algebra Teachers - Kerbs, Burgis & Jackson	10. Increasing mathematics content knowledge of upper elementary teachers – Davison & Hecimovic	16. An Assessment of the Mathematical Knowledge of Elementary Preservice Teach with regard to Number and Operation – Faulkenberry & Faulkenberry
Adobe	5. Perceptions of Parental Involvement in the mathematics Classroom - Carnes & Carnes	11. Mathematics in Early Childhood Special Education Settings - Wohlhuter	17. An Investigation into the Use of "Cheat Sheets" as "Study Guides" by Elementary Education Majors - Usnick & Ford
Phoenix	6. Development of a Geometric Spatial Visualization Assessment - Ganesh, Ji, Sherrod & Wilhelm	12. Adapting a Professional Development 5 Phase Model to Three Diverse School Environments - McGehee	

Santa Fe

(Phoenix Room)

Friday, March 7, 2008 Sessions 1-5 8:30 am -9:15 am

Session 1

Geometry and Measurement: Measuring Teachers' PCK and its Effect on Student Achievement

Agida G. Manizade, *Clemson University*

One of the main factors that influence students' mathematics learning is teacher's pedagogical content knowledge of mathematics. It is important to see ways in which such knowledge presents itself in the following activities: a) student-teacher discourse, b) lesson planning; and c) student assessment. This study focuses on assessing teacher's pedagogical content knowledge of geometry and measurement in middle school level and effects of such knowledge on student learning.

Session 2

What do you remember?

Dana Turner, *University of Central Oklahoma*
Cameron Soltani, *University of Central Oklahoma*

The goal of this study was to gain information about memorable math experiences in K-6. Surveys were administered to 300 undergraduate majors. Each student wrote about their most unforgettable mathematics moment. The responses were rated and assigned categories for analysis.

Session 3

Students' Experiences Symbolizing and Communicating in the Algebra Classroom

Wendy James, *Oklahoma State University*



Algebra is abstract and virtual in nature but is made available to be studied through representations and communication. This presentation describes students' experiences of algebra in most current algebra classes and presents literature that challenges the current manner in which algebra is taught. In understanding that the virtual nature of algebra is the conflict for most students and in providing possible lesson plans that would allow students to understand it conceptually, it is the hope of this presentation that algebra would be available for all students to learn.

Session 4

A Professional Development Model: Working with 6th grade Algebra Teachers

Angela S. Kerbs, *University of Michigan*
Kathy Burgis, *Aquinas College*
Nan Jackson, *Lansing Community College*

The role of algebra in the mathematics curriculum has changed considerably over the past few decades. National standards call for algebra to be a K-12 strand of mathematics, and the new Grade Level Content Expectations have greatly increased the role of algebra in Michigan elementary and middle schools. This means that middle grade teachers are now required to teach algebra. But the algebra that is appropriate for middle grade children is not just high school algebra at an earlier age. Moreover, the topics that constitute algebra have changed. A framework model for professional development will be presented and feedback solicited.

Session 5

Perceptions of Parental Involvement in the mathematics Classroom

Gwen Carnes, *Emporia State University*
James Carnes, *Herington High School*

Studies have identified parental involvement as a key factor in promoting academic achievement. On the other hand, that involvement has been known to diminish from the elementary setting to high school, particularly in mathematics. Using parent and student questionnaires from the Parent Involvement project, a significant difference was found between student and parent perceptions of parental involvement. Results indicate that teachers promoting parent involvement may need to work with parents to understand how students define and measure involvement in order to enhance student learning.

Session 6

Development of a Geometric Spatial Visualization Assessment

Bibi Ganesh, *Texas Tech University*

Junlong Ji, *Texas Tech University*

Sonya Sherrod, *Texas Tech University*

Jennifer Wilhelm, *Texas Tech University*

We report the development and examination of an assessment tool that will help identify middle school students' strategies and advancement in understanding of four geometric concepts (geometric spatial visualization, spatial projection, cardinal directions, and periodic patterns) after experiencing a carefully designed integrated lunar unit. Previous research with students using this lunar unit showed students making significant gains on lunar related concepts on a Lunar Phases Concept Inventory, or LPCI (Linden & Olsen, 2002). Following the administration of single domain assessments, clinical interviews were conducted to ascertain students' problem solving strategies. Results allowed us to select four suitable items.

Friday, March 7, 2008

Sessions 6-11

9:30 am - 10:15 am

Session 7

Funforms, a New Math Learning System

Joel Steinberg, *Case Western Reserve University*

Words and symbols are the chief tools used in human thought. Operations become much more transparent in Funforms, and follow simple easily learned rules. The ciphers are iconic. The continuity between fractions and whole numbers is well demonstrated in FF. Counting, adding, subtraction, multiplication, and division of whole numbers, fractions and mixed numbers will all be clearly demonstrated. Learning Funforms should produce benefits analogous in the benefits and advantages that learning a foreign language has on the understanding of one's native language.

Session 8

Boys' and Girls' Problem-Solving Strategies in Single-Gendered Classrooms

S. Megan Che, *Clemson University*

This presentation explores intersections and relationships between mathematics learning, gender, and equity. While much of the research on gendered patterns in mathematics learning focuses on early primary grades, this research project concentrates on middle-grades students. The setting for the study, a charter school with single-gendered classrooms, opens possibilities for a better understanding of gender, mathematics, learning, and equity.



Session 9

Family Math Nights – serving families, schools, and preservice teachers

Elaine Young, *Texas A&M University, Corpus Christi*

Family Math Nights are events that influence mathematics teaching and learning in multiple ways. This NSF- funded project provided preservice elementary and middle school teachers with experiences with parents prior to their first year of teaching. In addition, parents, students, teachers, administrators, and teacher educators were able to gain insight into the teaching and learning of mathematics. Activities and event designs will be shared.

Session 10

Increasing mathematics content knowledge of upper elementary teachers

David M. Davison, *Montana State University, Billings*

Tony Hecimovic, *Montana State University, Billings*

In the mathematics through Inquiry project, 18 teachers in four Billings, Montana area schools are involved in a two year project to increase their knowledge base in mathematics. The topic chosen for the professional development was rational numbers and relational thinking, based on teacher responses regarding the area of greatest need. A pretest in this area was given prior to the summer 2007 institute, and a post-test will be administered at the conclusion of the project in April 2008. Eleven days of professional development sessions are to occur during the school year. The focus of all of these sessions is instruction in rational numbers using inquiry-based strategies.

Session 11

Mathematics in Early Childhood Special Education Settings

Kay A. Wohlhuter, *University of Minnesota Duluth*

This session will describe the initial stages of a research project that is attempting to answer the following questions: What does mathematics look like in early childhood special education settings? Are teachers aware of the mathematics they are doing in their classrooms? Is there more mathematics that teachers could be going with their children?

Session 12

Adapting a Professional Development 5 Phase Model to Three Diverse School Environments

Jean J. McGehee, *University of Central Arkansas*

Since 2000, the Professional Development and Curriculum Alignment Project (PDCA) has studied changes in teacher practice and knowledge and has connected these changes to student achievement data both in the classroom and in large scale assessments. The project uses a five-phase model. The focus in this presentation is the adaptation of the model in a large school district with high percentages of minority populations, two small rural districts with a Caucasian majority, and a small rural district with greater than 90% African-American population. These districts are in three states. I will present the development and current work with the teachers in each district and will report how it relates to student achievement on state tests. While I have reported on two of these districts at past RCML conferences, I have not included data from the out of state districts. It has been interesting to study the replicability of our PDCA model.

Session 13***Preservice Teachers' Comments About Algorithms***

Carolyn Pinchback, *University of Central Arkansas*

This presentation will address the mission of RCML by disseminating research efforts designed to understand factors which influence mathematics learning. The presentation will focus on advantages, disadvantages and ways to use algorithms from the viewpoint of preservice teachers.

Session 14***Algebra By Any Means Necessary: Second Graders Learn the Basics***

Belvia L. Martin, Shaker-Heights Public Schools, Shaker-Heights, OH

This presentation/study explores some of the many ways that can be used to stimulate algebraic thinking in young children from various ethnic, racial and socioeconomic backgrounds. A range of methods have been employed to offer young minds opportunities to consider the basic knowledge and logic of the equation and become familiar with the terminology and basic function of algebra. This research will examine changes in attitudes and beliefs of students and their parents as they investigate some fundamental ideas in algebra.

Session 15***Journaling through a Professional Development Journey***

Donna H. Foss, *University of Central Arkansas*

The focus of this presentation will be a description of the results of the qualitative analysis of a professional development project for middle level mathematics teachers. The objectives of the research are to identify their conceptions of mathematics teaching and learning, and document changes in their knowledge, conceptions, and instructional behavior at the end of the third academic year of the project. These changes were studied through their reflective journals and observations of their teaching to determine the extent to which their instructional behaviors exemplify the content knowledge, delivery strategies, and the curriculum prescribed in the project.

Session 16***An Assessment of the Mathematical Knowledge of Elementary Preservice Teach with regard to Number and Operation***

Eileen Durand Faulkenberry, *Texas A&M, Commerce*

Thomas Faulkenberry, *Texas A&M, Commerce*

This presentation will discuss preliminary efforts to develop a scale used to measure elementary preservice teachers' knowledge of number and operation. We will discuss initial pilot testing (including psychometric data) as well as any changes to elementary teacher preparation curriculum that may be implemented as a result of the pilot data.

Carolyn Pinchback



Session 17

An Investigation into the Use of “Cheat Sheets” as “Study Guides” by Elementary Education Majors

Virginia Usnick, *University of Nevada, Las Vegas*

Marilyn Sue Ford, *University of Nevada, Las Vegas*

“Cheat sheets” have long been held in a negative light. This study investigates how these sheets are used when students are allowed to develop and use them when taking a final exam in an elementary mathematics methods course. It seems logical to assume that items placed on such a sheet are problematic/troublesome for students. So, what do elementary teacher candidates include on a “cheat sheet: for their final exam? This session will present samples as well as student responses to questions such as, “What did you put on your sheet that you didn’t use?” and “What do you wish you had put on your sheet?”

Friday, March 7, 2008

Lunch & Business Meeting

11:30 am – 1:15 pm

Buffet Lunch

Adobe and Phoenix Rooms located in the Conference Center

3:40-4:25

4:40-5:25

Overview of Friday Afternoon Sessions

	1:30-2:15	2:30-3:15	3:30-4:15	4:30-5:15
Mesa	18. Meeting Diverse Learning Needs through Differentiated Instruction in a Graduate Math Class - Brown & Huss-Keeler	24. Using Your Skills to Benefit All Disciplines - Boliver	30. Having Their Say: Middle School Mathematics Students Talk about Mathematics and Their Mathematics Teachers - Showalter	36. Lesson Study at the College Level - Metheny, Davison, Mitchell & Miller
Patio	19. Geometric Gender Gap? Middle School Students Develop Geometric Spatial Abilities - Wilhelm & Sherrod	25. Coming to Know Mathematics: The Journeys of Three Women - Jordan	31. What parents report when working with their children on mathematical tasks - Olson, Olson & Okazaki	37. Investigating Non-Routine Tasks through Pattern Finding - Richardson
Navajo	20. Virtual Manipulatives: A promise and A Threat (an update) - Speer	26. Theoristic Learning: A cross-cultural mode of the normal and exceptional - Greeno	32. Poincare's Notion of Intuition and Its Implications for Mathematics Education - Lu	38. Exploring Prospective Elementary Teachers Content Knowledge and Attitudes Toward the Teaching and Learning of the Division of Fractions - Redmond & Utley
Executive Suite	21. Algebra in the Middle Grades: Improving Teacher Content and Pedagogical Knowledge - Reeder & Nicholas	27. What's working-what's not: Math for students with learning Disabilities - Babbitt	33. Mathematics Study Skills Inventory (MSSI): A comparative Analysis of Developmental and College Mathematics - Obiekwe	39. Mathematical Discourses in Two Secondary Pre-Calculus Classrooms - Pourdavood, Skitzki & Wachira
Adobe	22. Using the CREDE Standards to Enhance Mathematics Learning - Maxwell	28. A Glimpse into Pre-service Elementary Teachers' Views of Teaching Mathematics and Science - Cassel & Vincent	34. The Influence of Individual Differences on Mathematics Problem Solving - Hadfield	40. College Algebra for All - Traditional or Computer-Assisted - Murray & Lucas
Phoenix	23. Online Learning in Mathematics Teaching and Learning - Wachira & Keengwe <i>Session Cancelled</i>	29. How do middle school teachers describe mathematics? Why does it matter? - Reynolds, Mikusa & White	35. Differences in Mathematical Understanding When Using a Dynamic Geometry Environment - Cruz	41. Teacher Openings: Emergence of a Learning Community among Middle School Mathematics Teachers - Matney

Entire

Session 18***Meeting Diverse Learning Needs through Differentiated Instruction in a Graduate Math Class***

Sue Brown, *University of Houston, Clear Lake*

Rebecca Huss-Keeler, *University of Houston, Clear Lake*

This presentation will describe the strategies used and challenges faced in attempting to meet the diverse learning needs of graduate pre-service (students who are not yet teaching and alternative certification students) and experienced in-service teachers in the same cross-listed class focused on early childhood mathematics methods. The research questions center on “How can the instructor best meet the learning needs of such diverse students in the same class?” and “What are students’ opinions of attending classes with students with such differing levels of teaching experience?” The presentation will describe the lessons learned and the changes that resulted in order to make the cross-listed course a successful learning experience for all students. Data from the 2007 class will also be shared. Same syllabi and course assignments will be shared. Participants will be asked to share their strategies for meeting the challenge of diversity of experience in the same class.

Session 19***Geometric Gender Gap? Middle School Students Develop Geometric Spatial Abilities***

Jennifer Wilhelm, *Texas Tech University*

Sonya Sherrod, *Texas Tech University*

This presentation addresses the concerns of those learners who are low achievers by reason of gender. Traditional teaching methods have resulted in disparately fewer numbers of females (as compared to numbers of males) entering careers in mathematics and engineering. Results of this study shed light on the mathematical achievements of which females are capable as a result of learning through inquiry.

Session 20***Virtual Manipulatives: A Promise and A Threat (an update)***

William R. Speer, *University of Nevada, Las Vegas*

Research is limited on assessment of computer- based or virtual manipulatives in mathematics instruction. While research into the use of emerging technologies continues, there are some variables to consider when using, or measuring the effects of virtual manipulative use. The research design, sampling characteristics, and type of manipulative used may influence student achievement. For example, studies that show evidence of increased achievement when classroom teachers believed virtual manipulatives fit in with the natural flow of the curriculum. Studies that used computer- simulated Base- 10 blocks, two-color counters, and fraction strips produced positive results. Other variables that may influence the effectiveness of using virtual or physical manipulatives include: previous experience with computers, grade level, mathematical topic, treatment length, student attitudes toward mathematics, and computer-to-student ratio.

Session 21

Algebra in the Middle Grades: Improving Teacher Content and Pedagogical Knowledge

Stacy Reeder, *University of Oklahoma*
Sacra Nicholas, *University of Oklahoma*



The results of research conducted as part of professional development project for intermediate and middle level teachers focused on the improvement of algebra algebraic thinking content and pedagogical knowledge will be presented. Additionally, participants will be involved in a variety of tasks and activities used to improve algebra and algebraic thinking content and pedagogy.

Session 22

Using the CREDE Standards to Enhance Mathematics Learning

Sheryl A. Maxwell, *University of Memphis*

This session highlights learners' progress in understanding the teaching of mathematics when experiencing using the CREDE strategies (Tharp) in a reinvented mathematics methods course. 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 23

Online Learning in Mathematics Teacher Education

Patrick Wachira, *Cleveland State University*
Jared Keengwe, *University of North Dakota*

E-learning has become an important means for teaching and learning. Consequently, many universities across the US and abroad are putting many courses online. The emergence of E-learning is especially timely as it provides one way to meet the ambitious goals set by the No Child Left Behind Act to have a "highly qualified" teacher in every classroom. Despite its rising popularity, some questions remain as to the quality and effectiveness of E-learning. Through a review of research this presentation explores online learning in mathematics teacher education.

Friday, March 7, 2008

Sessions 24-29

2:30 pm - 3:15 pm

Session 24

Using Your Skills to Benefit All Disciplines

David E. Boliver, *University of Central Oklahoma*

On the occasion of his retirement, the proposed was asked to prepare a program based on what he had learned in 40 years of collegiate mathematics teaching. He chose to construct an in-service training power-point presentation for all faculty engaged in teaching those who were not their majors, but needed the material presented for reasons of certification or graduation requirement. Only a few of those who attended were mathematics educators and more were from other disciplines. This presentation will be used as a basis for a discussion of sharing by mathematics educators for a general audience.

Session 25

Coming to Know Mathematics: The Journeys of Three Women

Patricia Lamphere Jordan, *Oklahoma State University*

This presentation is a portraiture study of the journey that three very different women enrolled in a primary mathematics methods course have taken in arriving at their career choices. Each woman brings a unique perspective to their future classrooms: one is a traditional African-American student majoring in elementary education; the second is a non-traditional student who is the mother to six children under the age of nine who is majoring in early childhood education and the third is a non-traditional Native American student majoring in mathematics who just happens to be deaf. These stories will help to inform mathematics educators as they study the effects personal experience has on the learning of mathematics in the K-16 classroom.

Session 26

Theoristic Learning: A cross-cultural mode of the normal and exceptional

Clyde Greeno, *Mathematics Institute, Tulsa, OK*

In all cultures, all functional humans – normal or exceptional – instinctively and intuitively rely on a theoristic kind of learning that routinely is neglected by most mathematics educators. At the conscious and formal levels of psychomathematical processing, theoristic learning is done by rationally generating concepts, and by rationally perceiving relationships among those concepts (mathematical research being the epitome of that kind of learning). But at informal, intuitive, or subconscious levels, theoristic learning is less precise, less structured, and more rudimentary, but nonetheless rational kind. Easily replicable clinical methods disclose that, and how, a high percentage of students flounder with curricular mathematics, because of its failures to guide them to construct reasonable personal mathematical theories. Clinical methods also reveal how to easily empower students to theoristically comprehend many (if not all) of the traditionally troublesome topics of the core curriculum.

Session 27

What's working-what's not: Math for students with learning Disabilities

Bea Babbitt, *University of Nevada, Las Vegas*

A significant subset of students with learning disabilities struggle to learn both basic and advanced mathematics. Some struggle with understanding underlying mathematical concepts. Others struggle with sequencing skills required to execute math algorithms. Many struggle with recognizing and then holding all the elements of a mathematical problem in mind as they problem solve. But all students bring some learning strengths to mathematical tasks. This session will focus on those instructional strategies that have been found to help students capitalize on their strengths while addressing areas of difficulty in mathematics. In the process the session will summarize what's working and what's not working in teaching mathematics to students with learning disabilities.

Session 28

A Glimpse into Pre-service Elementary Teachers' Views of Teaching Mathematics and Science

Darlinda Cassel, *University of Central Oklahoma*

Dan Vincent, *University of Central Oklahoma*

The objectives of the research were to identify and examine pre-service teachers' views about the way science and mathematics should be taught. The pre-service teachers in two methods courses, mathematics and science, were asked to complete the metaphor, "Teaching (mathematics/ science) is _____." The students were also asked to illustrate their metaphors. We will discuss some differences and similarities between the metaphors.

Session 29

How do middle school teachers describe mathematics? Why does it matter?

Anne Reynolds, *Kent State University*

Michael Mikusa, *Kent State University*

Donald White, *Kent State University*

We will report on Mathematics in Mathematics Education (MME) classes that faculty from mathematics and mathematics education have developed and have been delivering for a number of semesters. These classes are intended to address the mathematical content needed for middle grades mathematics teachers whose original license was an elementary teacher with minimal mathematics content in their professional preparation. There are two unique components to the structure of these classes: 1) the embedding of the teachers' learning of mathematics within their extending of their learning about the mathematics of their students (mathematics education) and 2) each class is co-taught by a mathematics and a mathematics education faculty member. For this presentation we will focus on participants' developing ideas about what it means to do and learn mathematics.

Refreshments During Break

Hallway near Sante Fe, Adobe & Phoenix located in the Conference Center

Friday, March 7, 2008

Sessions 30-35

3:40 pm - 4:25 pm

Session 30

Having Their Say: Middle School Mathematics Students Talk about Mathematics and Their Mathematics Teachers

Betsy Showalter, *Langston University*

What would a middle school mathematics student request in an advertisement for a mathematics teacher? In this study, the author explored the relationship between eight middle school mathematics teachers and fifteen of their students. The students shared their views on careers, mathematics, their mathematics teachers, and how these factors influence their learning of mathematics. The findings of this research can provide insight that would complement the formal pedagogical and content curriculum found in teacher preparation programs.

Session 31

What Parents Report When Working With Their Children on Mathematical Tasks

Melfried Olson, *University of Hawaii*

Judith Olson, *University of Hawaii*

Claire Okazaki, *University of Hawaii*

This presentation is part of a larger study which focuses on language parents and children use when working together on mathematical tasks. Parents and their 3rd or 4th grade children worked on three tasks, one each in number, algebra and geometry. Before working on the tasks, parents were asked to complete the prompt, "In anticipation of doing mathematical tasks with my child, I feel..." After completion of the tasks, parents were asked to complete the prompt, "Now that I have completed the mathematical tasks with my child, I feel..." Responses to these prompts have been examined and categorized as 1) parents' attitudes and beliefs regarding their children's abilities and efforts, 2) parents' attitudes about participating in the study, and 3) parents' views of the benefits from their participation. Presenters will share the analyses of parents' comments on these issues and how this information might be helpful to teachers and researchers as they develop programs for working with parents.

Session 32

Lynae Sakshaug Analysis of an online environment. (see blue sheet)

Poincare's Notion of Intuition and Its Implications for Mathematics Education

Lianfang Lu, *Louisiana State University*

Henry Poincare's notion of intuition and its implications in mathematics teaching and learning will be explored and ideas shared for discussion during this presentation.

Session 33

Mathematics Study Skills Inventory (MSSI): A comparative Analysis of Developmental and College Mathematics

Jerry Obiekwe, *University of Akron*

This study evaluated the Mathematics Study Skills Inventory (MSSI) with college students enrolled in developmental and college level mathematics, in terms of its psychometric characteristics. MSSI is an instrument that assesses the mathematics study skills of college students. However, its psychometric qualities have not been rigorously tested. MSSI was found to be predictive of students' math grades. Two latent factors were derived, and each of them appeared to be predictive of math grades as well. Its internal consistency was sound. In conclusion, MSSI is a valid and reliable instrument that can be used to give students accurate feedback on their math study skills in the college level math courses as well as developmental mathematics courses. The implications of teaching and learning mathematics will be discussed.

Session 34

The Influence of Individual Differences on Mathematics Problem Solving

Oakley D. Hadfield, *New Mexico State University*



Subjects completed paper and pencil inventories related to spatial visualization and deductive reasoning ability, as well as basic mathematics skills. These variables were then included in a structural model for the prediction of non-routine mathematics problem solving performance. Although reasoning ability was the best predictor, all factors, including basic mathematics skills, made significant contributions to the model of best fit, in either exogenous or mediational positions.

Session 35

Differences in Mathematical Understanding When Using a Dynamic Geometry Environment

Mary Jane Cruz, *Texas Tech University*

Geometry, the concept of measurement in particular, and the effects of technology are the focal points of this study. An investigation was conducted on two sets of elementary pre-service teachers which attempted to answer the question: Does the level of conceptual understanding differ when technology such as the Geometer's Sketchpad, a dynamic geometry environment, is used as opposed to teaching a lesson without the benefit of technology? The paper describes this study and its outcomes.

Friday, March 7, 2008

Sessions 36-41

4:40 pm - 5:25 pm

Session 36

Lesson Study at the College Level

Dixie Metheny, *Montana State University, Billings*
David Davison, *Montana State University, Billings*
Johanna Mitchell, *Montana State University, Billings*
Ken Miller, *Montana State University, Billings*

Four university professors wanted to use the Lesson Study approach to strengthen their teaching at the university level. We chose an activity integrating math and science which we had used many times to see how we could improve our teaching. The activity was done using both teacher directed and student centered teaching approaches. Our purpose was to have our students see the strength and weaknesses of each of the approaches and to experience the Lesson Study process. We will describe both our results as well as those of the students.

Session 37

Investigating Non-Routine Tasks through Pattern Finding

Kerri Richardson, *University of North Carolina, Greensboro*

Pattern finding can be an excellent tool in helping students make sense of mathematical ideas. In this paper, I outline a teaching experiment (Lesh & Kelly, 1994) with preservice teachers that will be conducted with other researchers. In the experiment, we will pose the preservice teachers a non-routine Algebra problem which is replete with patterns. At the time of this abstract, our findings have not been reported.

Session 38

Exploring Prospective Elementary Teachers Content Knowledge and Attitudes Toward the Teaching and Learning of the Division of Fractions

Adrienne Redmond, *Oklahoma State University*
Juliana Utley, *Oklahoma State University*

The presentation will disseminate research findings on the affect of a mathematics methods course on prospective elementary teachers' content and pedagogical content knowledge of and attitudes toward the teaching and learning of division of fractions.

Wikilpress resources
- good geometer's sketchpad resources

Key Curriculum Press
- TinkerPlots
- technology for dem ed.
- navigator

Roland Pourdavood, *Cleveland State University*
Raymond Skitzki, *Cleveland State University*
Patrick Wachira, *Cleveland State University*

This presentation addresses the mission of RCML by focusing on two secondary mathematics classrooms language and communication. It demonstrates the importance of teacher's active listening and questioning strategies for students' development of mathematical dispositions.

Session 40

College Algebra for All – Traditional or Computer-Assisted

Cynthia Murray, *University of Central Oklahoma*
Carol A. Lucas, *University of Central Oklahoma*

College Algebra is at some universities a requirement for graduation and for all universities serves as a gateway to further mathematics courses, science courses, and business courses. If students are unable to successfully complete this level of mathematics, their career options have been significantly reduced. Thus, the importance of success in this course is clear and the question is what type of instruction will help the students be successful. This presentation will provide research results as to whether students are better served by the traditional lecture format college algebra course or a computer assisted course. Academic performance in the course and subsequent math courses will be factors that are considered in the measurement of success. Student preference will also be considered.

Session 41

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

Gabriel Matney, *University of Arkansas, 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.

Dinner on Your Own

Please see the trolley information to Brick Town and the list of restaurants in Brick as well as those within walking distance of the hotel.



Saturday, March 8, 2008

Overview of Saturday Morning Sessions			
	8:30-9:15	9:30-10:15	10:30-11:15
Mesa	42. The Effects of Stereotype Threat on the Math Performance of Children and Adolescents: When Does Alleviation Count? - McJunkin	47. Are Gifted Students Surviving Or Thriving In The Public Schools? - Zollman	52. A Glimpse into an Interactive Video Education Preservice Elementary Teacher Geometry Class – Hanlon
Patio	43. Reasoning and models middle grade students use when solving fraction worded problems - Olson	48. What to do with “NCLB” and “Math for All” College Students - Mallam	53. Rhizomatous motivational aspects of Hispanic/Latino High School Students in Algebra I - Ruiz
Executive Suite	44. Analysis of Gender Differences on Mathematics Contest Items - Moldavan	49. Teaching and Learning Mathematics in South Africa: Four Parallel Case Studies - Pourdavood	54. The summer Bridge program: Helping under-prepared students become ready for college - Risser & Booker
Adobe	45. DATA: Data Analysis for Teachers in Arkansas - Robinson & Hall	50. An Investigation of the Internal Structure of Algebra Word Problems and its implications to Teaching and Learning - Obiekwe	55. Analysis of an on-line environment for preparing career changers to teach grades 6-12 math in urban schools - Sakshaug
Phoenix	46. Working Memory: Cognitive and Instructional Implications for Mathematics - Faulkenberry	51. Exploring Students’ Conceptual Understanding of Measures of Spread - Turegun & Reeder	56. Preparing a Proposal to Host the Annual Conference - Boliver

Saturday, March 8, 2008

Sessions 42-47

8:30 am - 9:15 am

Session 42

The Effects of Stereotype Threat on the Math Performance of Children and Adolescents: When Does Alleviation Count?

Linette M. McJunkin, *Emporia State University*

Considering stereotype threat theory and the extreme importance placed upon assessment scores, I attempted to evaluate when students are first susceptible to the beneficial effects of alleviating stereotype threat. I utilized third quarter mathematics assessment scores of elementary and junior high students from a small Midwestern community (population approximately 26,700). Stereotype threat was alleviated for 102 students with the simple statement, “this is a fair test; everyone will do well on this test,” the 42 students within the control group that received no alleviation information prior to the exam. The findings suggest the presence of stereotype lift that Walton and Cohen (2003) outlined in their research, as well as the negative effects of removing stereotypes and bias for white males.

Session 43

Reasoning and Models Middle Grade Students Use When Solving Fraction Worded Problems

Melfried Olson, *University of Hawaii*

This presentation is part of a continuing examination of research with fraction concepts and models that students employ when working with fractions. In this session, participants will focus on three worded problems that involve fractions. Student responses have been classified according to correctness, reasoning used, and types of models used. The problems were used as part of instruction in a 5th grade classroom and administered as an assessment for students in 6th, 7th, and 8th grade classrooms. Data on students thinking and reasoning across these grade levels will be presented for analysis. While the problems relate to situations that involve the use of proportions, appropriate models, especially models that emphasize common numerators, can be used to generate solutions.

Session 44

Analysis of Gender Differences on Mathematics Contest Items

Carla Moldavan, *Berry College*

National Assessment of Educational Progress (NAEP) data will be presented to raise questions about gender differences. Results of item analyses and chi-square analyses on questions used in mathematics contests for sixth-graders, seventh/eighth-graders, and high school students will be presented. The pattern of the number of items with significant differences will be explored, comparing the other hypotheses for further exploration.

Session 45

DATA: Data Analysis for Teachers in Arkansas

Sally Robinson, *University of Arkansas, Little Rock*
Michael Hall, *Arkansas State University*

This presentation will share a NCLB IIa funded grant project that taught the mathematical content knowledge of data analysis to mathematics, science and reading literacy teachers in grades 5-12 while using authentic data throughout the workshop process. Data based decision making in their own environment, including examining ethnic and cultural subgroups, was a strong aspect of the project.

Session 46

Working Memory: Cognitive and Instructional Implications for Mathematics

Thomas Faulkenberry, *Texas A&M University, Commerce*

This presentation is focused on examining the current (and future) state of affairs of working memory research in mathematical cognition. Specifically, we will first describe Baddeley's (1986) working memory model and how it guides the research methodology used. Second, we will describe some of the key findings regarding the role of working memory in mathematical cognition. Finally, we will look at the link between math disabilities (such as math anxiety) and working memory.

Session 47***Are Gifted Students Surviving Or Thriving In The Public Schools?***

Alan Zollman, *Northern Illinois University*

Are gifted students surviving or thriving? In the mathematics classroom, too often, the answer is “it depends.” The public school has priorities other than the individual gifted students’ needs. The United States – indeed the modern world - demands all students, particularly the highly and extremely gifted, to attain self-actualization. This talk will: (1) review the different types of gifted students, (2) delineate different approaches to fulfilling the needs of the gifted, (3) discuss the current barriers to meeting the needs of the highly and extremely gifted, (4) examine the opportunities available for the gifted, and, (5) speculate on the future for gifted mathematics student.

Session 48***What to do with “NCLB” and “Math for All” College Students***

Winifred A. Mallam, *Texas Woman’s University*

This session will discuss the attitudes and achievement of students in a core curriculum 100-level mathematics course titled “Quantitative Literacy”. Students in the course might be products of NCLB programs. Attention will also focus on the development and implementation of the course content.

Session 49***Teaching and Learning Mathematics in South Africa: Four Parallel Case Studies***

Roland Pourdavood, *Cleveland State University*

The intention of this study is to elaborate mathematical discourse and teaching methods in four different K-7 schools in the Eastern Cape Province of South Africa (one English-speaking school, one Afrikaans-speaking school, and two black Xhosa-speaking schools). The study demonstrates the importance of history and culture that shape mathematical contents, mathematics teaching, and mathematics learning in those four schools. In addition, the study discusses the priorities of principals, teachers, students, and parents in those four schools and the relationships between those priorities and classroom practices.

Session 50

An Investigation of the Internal Structure of Algebra Word Problems and its implications to Teaching and Learning

Jerry Obiekwe, *University of Akron*

Mayer, Larkin, & Kadane (1984) proposed four phases of solving algebra word problems. The four phases are translation, understanding, planning, and execution. According to Mayer et al., there are specific types of knowledge that are necessary in each of these phases for solving word problems. The translation phase requires linguistics and factual knowledge, the understanding phase requires schematic knowledge, the planning phase requires strategic knowledge, and the execution phase requires algorithmic knowledge. Mayer et al. suggest that the failure to solve a mathematical problem may be attributed to the lack of any of these types of knowledge. This study attempted to validate Mayer et al's proposal via Medina-Diaz's (1993) cognitive steps of solving algebra, and Linear Logistics Test Model (LLTM). The results of this study and its implication to teaching and learning algebra word problems at the college level will be discussed.

Session 51

Exploring Students' Conceptual Understanding of Measures of Spread

Mike Turegun, *Oklahoma City Community College*
Stacy Reeder, *University of Oklahoma*

The results of research conducted on the conceptual understanding of measure of spread among a group of community college students in an introductory statistics course taught with an emphasis on conceptual understanding will be presented. Participants will be presented a questionnaire developed as a research instrument to gain access into and assess the conceptual understanding of a group of 20 students. A detailed analysis of the students' response is presented to reveal the range of students' conceptions. A set of possible rubrics for use by teachers/researchers will be provided.

Saturday, March 8, 2008

Sessions 54-58

10:30 am - 11:15 am

Session 52

A Glimpse into an Interactive Video Education Preservice Elementary Teacher Geometry Class

Adele Hanlon, *University of Central Oklahoma*

Can a standards-based geometry course be taught effectively to preservice elementary teachers using an interactive video education format? This pilot study examines achievement, attitudes, and student's views regarding a required mathematics course with respect to students being taught in a traditional format, and those at the onsite and remote locations in the distance education format.

Session 53

Rhizomatous motivational aspects of Hispanic/Latino High School Students in Algebra I

Elsa Cantu Ruiz, *University of Texas, San Antonio*

As mathematics teachers gain knowledge of what factors minority students perceive as motivating, they will be able to create a classroom environment that better increases motivation of all students. Thus, the information gathered from this study will be useful and meaningful to teachers of mathematics in their quest for finding strategies that persuade students of mathematics to become life-long learners.

Session 54

The summer Bridge program: Helping under-prepared students become ready for college

H. Smith Risser, *Texas Woman's University*

Sarah Booker, *Texas Woman's University*

During the summer of 2007, Dallas Independent School District and Texas Woman's University collaborated on a project funded by the Texas Higher Education Coordinating Board. Students entering the 11th or 12th grade who were not currently meeting college readiness benchmarks on the Texas Assessment of Knowledge and Skills (TAKS) were eligible to participate in the program. A large percentage of the students enrolled in the program were economically disadvantaged and/or minorities. The program provided four weeks of instruction during the summer and follow up activities during the 2007-2008 school year. The structure and outcomes of the program will be discussed.

Session 55

Analysis of an on-line environment for preparing career changers to teach grades 6-12 math in urban schools

Lynae Sakshaug, *SUNY College at Brockport*

In this session, the researcher will share the design and implementation results to-date of a NY state and federally funded program for certification of 6-12 mathematics teachers. The program is designed to increase the number of qualified, certified math teachers teaching in urban, high-need districts across the state of NY. The teachers are being prepared in an environment that is primarily on-line and asynchronous. Results, including strengths and weaknesses of the design and implementation will be shared. In addition, there will be time set aside for discussion of the program and of the nature of math teacher preparation in an on-line environment.

Session 56

Preparing a Proposal to Host the Annual Conference

David Boliver, *University of Central Oklahoma*

Copies of all materials and suggested timetables needed for an RCML conference proposal will be shared with the participants, including examples of how the documents have been successfully prepared in the past. Questions will be encouraged and participants asked to float ideas.

Saturday, March 8, 2008

Wilson Lecture

11:30 am – 12:30 pm

Adobe and Phoenix Rooms located in the Conference Center

Adages by Alan: Advice for Living presented by Alan Jones

Saturday, March 8, 2008

Lunch

12:30 pm – 1:30 pm

The Adobe and Phoenix Rooms located in the Conference Center.

A special thank you to ...

- ◆ Oklahoma State University for our conference programs.
- ◆ University of Central Oklahoma for our conference name badges.
- ◆ University of Oklahoma for our Thursday evening reception.