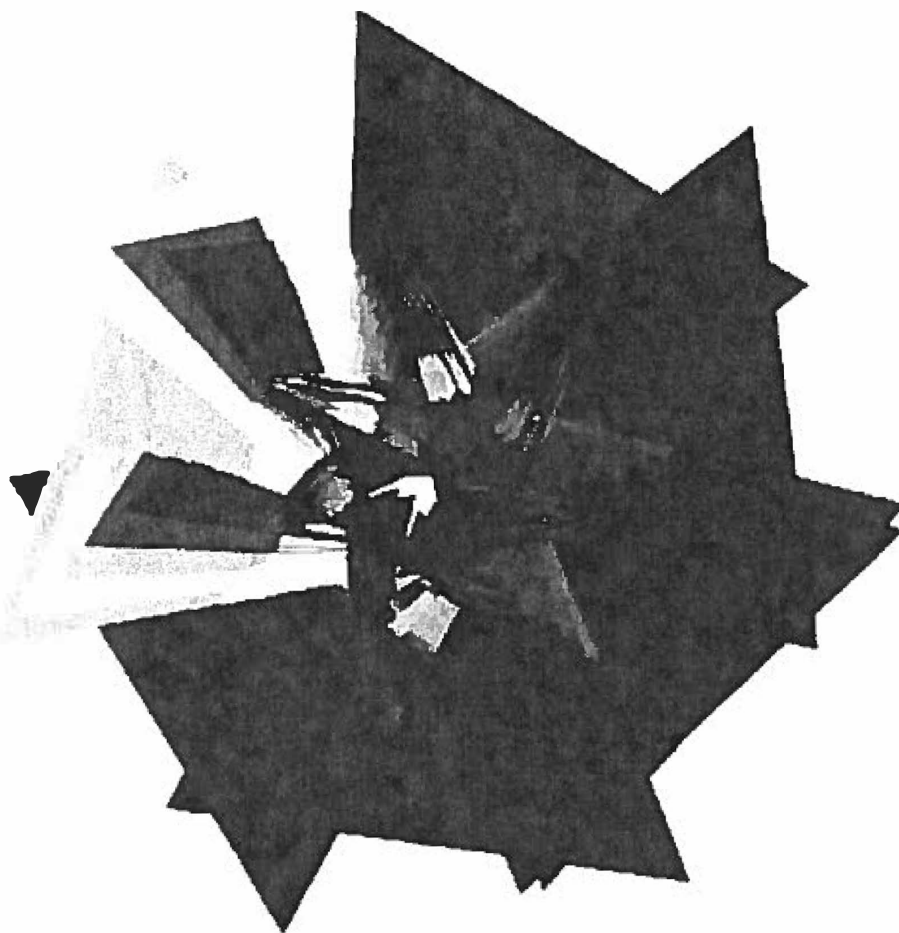




Thirty-second Annual
**Research Council on
Mathematics Learning Conference**
February 24-26, 2005
Little Rock, Arkansas



Hosted by:
Arkansas Center for Mathematics & Science Education
University of Central Arkansas

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Thursday, February 24, 2005

Room	1 p.m. - 5 p.m.	5 p.m. - 7 p.m.	7 p.m. - 8:30 p.m.
Silver City VII	X	X	X
Arkansas Diamond	X	X	X
Arkansas Traveler	X	X	X
Argenta East	X	X	X
Argenta West	X	X	X
Silver City V & VI	X	Welcome Reception	Birds of a Feather
Ballroom Foyer	Registration	Registration	Registration

Saturday February 26, 2005 Morning

Room	7:00 - 8:30	8:30 - 9:15	9:25 - 10:05	10:15 - 11:00	11:00 - 11:45	11:45-12:00
Silver City VII	X	Session 37 <i>Young Children's Artwork as a Reflection of Mathematical Understanding</i>	Session 42 <i>College Algebra Reform: The Report of an Attempt</i>	Session 47 <i>Real-Life Connections Help Students with Mathematics Learning Problems</i>	Sorry-- Session Cancelled	X
Arkansas Diamond	X	Session 38 <i>Examining the Originations of Aversions Toward Mathematics Affecting Non-Math, Non-Science Majors</i>	Session 43 <i>A Geometry Model for Mathematics Teachers</i>	Session 48 <i>Analyzing Solution Strategies Among Different Populations to a Constructivist Pattern Problem</i>	Session 53 <i>Learning About Teaching Mathematics Through Critical Incident Reflection</i>	X
Arkansas Traveler	X	Sorry-- Session Cancelled	Session 44 <i>Listening as an Integral Part of an Emergent Mathematics Curriculum</i>	Session 49 <i>Neither Equal nor Equitable: Implementation of the NCTM Standards with African American Students</i>	Sorry-- Session Cancelled	X
Argenta East	X	Session 40 <i>Writing in Mathematics for Meaning</i>	Session 45 <i>Using Information Technology to Enhance Teacher Quality and Improve Student Achievement in Mathematics</i>	Session 50 <i>The Coaching/Mentoring Relationship: What Does Each Partner Gain?</i>	Session 55 <i>Professional Development for Pre-Service and Novice Educators</i>	X
Argenta West	X	Session 41 <i>Problem Solving Discourse: A Case Study of Four Ninth Grade Mathematics Students</i>	Session 46 <i>Creating Desirable Difficulties</i>	Session 51 <i>Concepts of Mathematics and Mathematics Teaching and Learning: Contrasts and Conflicts</i>	Session 56 <i>Prospective Elementary Teachers' Visual Images of Teaching Mathematics</i>	X
Silver City V & VI	Breakfast <i>The Harmful Effects of Teaching "Carrying" and "Borrowing"</i>	X	X	X	X	Lunch
Ballroom Foyer	Registration	Registration	Registration	Registration	Registration	

RCML 2005 Conference Schedule of Events

Thursday, February 24, 2005

Registration 1:00 PM – 5:00 PM

Reception 5:00 PM – 7:00 PM

Birds of a Feather Discussions 7:00 PM – 8:30 PM

The three Birds-of-a-feather sessions will provide opportunities for newcomers to meet in an open forum with other RCML members, discuss issues of interest, and share research and ideas. In addition, the BOFs should set the tone for on-going conversations along these themes throughout the conference. All Birds of a Feather discussions will be held in the Silver City V & VI.

Topic: **Technology**
Facilitator: David Boliver

Topic: **Teacher Education**
Facilitator: Alan Zollman

Topic: **Beginning Research - Collaborating in Research**
Facilitator: Sally Robison

Friday, February 25, 2005

Continental Breakfast 7:00 AM – 8:00 AM

Session 1 8:00 AM – 9:00 AM

Sessions 2-6 9:10 AM – 9:55 AM

Coffee Break 9:55 AM – 10:10 AM

Sessions 7-11 10:10 AM – 10:55 AM

Sessions 12-16 11:05 AM – 11:55 AM

Lunch Business Meeting	Noon – 1:30 PM
Sessions 17-21	1:30 PM – 2:15 PM
Sessions 22-26	2:25 PM – 3:10 PM
Sessions 27-31	3:20 PM – 4:05 PM
Sessions 32-36	4:15 PM – 5:00 PM
Special Session: Quilters Mix it up---Arkansas, Mathematics, and Quilts By Jaynette Huff	5:00 PM – 5:45 PM
Dinner and Keynote Speaker	6:00 PM – 7:30 PM

Saturday, February 26, 2005

Continental Breakfast	7:00 AM – 8:30 AM
Sessions 37-41	8:30 AM – 9:15 AM
Sessions 42-46	9:25 AM – 10:05 AM
Sessions 47-51	10:15 AM – 11:00 AM
Sessions 52-56	11:00 AM – 11:45 AM
Lunch	11:45 AM – 12:45 AM
Clinton Library Excursion	1:00 PM – 5:30 PM

Friday, February 25, 2005

Continental Breakfast

7:00 AM – 8:00 AM

Session 1

8:00 AM – 9:00 AM

Session 1

Room: Silver City VII

Abacaba-Dabacaba!

Dr. Michael Naylor, Western Washington University

Take a fast and fun romp through the world of pattern! We'll follow a single mathematical thread and marvel as it weaves through geometry, algebra, fractals, puzzles, poetry, art, music, higher-dimensional space. . .and beyond!

Sessions 2-6

9:10 AM – 9:55 AM

Session 2

Room: Silver City VII

Developmental Understanding of the Basic Multiplication Facts

Viginia Usnick, University of Nevada-Las Vegas
Mary Sue Ford, University of Nevada-Las Vegas

Elementary students, pre-service, and in-service teachers were assessed to determine their understanding of multiplication as related to basic facts. The findings of this research may be used to inform the developmental stages of multiplicative thinking.

Session 3

Room: Arkansas Diamond

Examining Assessment Issues in the Use of a District Algebra Test

Dr. Jeff Shih, University of Nevada-Las Vegas

This session will offer the preliminary results of the analysis of a large-scale district algebra test administered to eighth grade students. Response patterns will be disaggregated by gender and ethnicity and policy implications will be discussed.

Session 4

Room: Arkansas Traveler

Helping Middle School Math Teachers Become Highly Qualified in Accordance with NCLB

David Davison, Montana State University- Billings
Dixie Metheny, Montana State University-Billings

The presenters have partnered with a local school district to help middle school math teachers become highly qualified in accordance with the NCLB Act. Information about the program along with preliminary results will be shared.

λ Session 5

Room: Silver City IV

Long-Distance Lesson Study: "Making Boxes" an Elementary Geometry Lesson for a Mathematics Education Methods Course

Angela Krebs, University of Michigan-Dearborn

Kathy Burgis, Aquinas College

Kim Hartweg, Western Illinois University

The Lesson Study is a model that is often used to study mathematics teaching. However, for mathematics educators who have teaching loads, are in remote locations, or are in small departments, it might be difficult for them to have the opportunity to collaborate in this way. This session explores three mathematics educators' use of videotape to explore their teaching in a modified Lesson Study format. We collaborated on a lesson plan for a geometry class in our elementary methods course. After the first person taught the lesson, we shared videotapes of the lesson, analyzed, and then revised the lesson. Another colleague taught the lesson, and we repeated the process until we had analyzed each iteration of our revised lesson.

Session 6

Room: Argenta West

Geometry: Visualization and Manipulation for Understanding

Dr. Darlinda Cassel, Oklahoma State University

Stacy Reeder, Oklahoma State University

Phyllis Bolin, Oklahoma Christian University

This presentation will provide an overview of a geometry workshop funded by No Child Left Behind. Results of data collected on intermediate mathematics teachers' geometry teaching efficacy, geometry content understanding, and geometry pedagogical practices will also be presented.

Sessions 7-11

10:10 AM – 10:55 AM

Session 7

Room: Silver City VII

Development of Algebraic Thinking in Elementary Mathematics

Cynthia Hernon, N

Sorry—Session Cancelled

The research project is led by first grade teachers working to integrate the teaching of algebraic thinking into their existing arithmetic curriculum.

Session 8

Room: Arkansas Diamond

Investigating Teacher Change: A Study of an Algebra Teacher's Transformation

Dr. Sheryl Maxwell, University of Memphis

This session highlights an eighth grade teacher's journey and progress as he designs and implements project-based activities that stimulate conceptual learning of algebra through real-world contexts. Insights coalesced from three data sources will be shared by the presenter/researcher. Seeds of visionary projects can be sown through discourse opportunities about mathematics reform efforts.

Session 9

Room: Arkansas Traveler

Improving Middle Grades Math Achievement by Improving Teacher's Math Content

Dr. Cynthia Miller, Arkansas State University
Dr. Karen Yanowitz, Arkansas State University

Learn about an ongoing Arkansas State University NCLB Partnership grant to improve math achievement at high-need schools by improving their teachers' math content through a 2004 Summer Academy, Saturday sessions, and classroom model lessons, team teaching, and observations.

Session 10

Room: Silver City IV

Online Mentoring: Lessons Learned

Ramakrishnan Menon, California State University - LA

Preservice teachers doing a middle school math methods course had a few weeks of online mentoring of students from all over the country, as part of the requirements of the course. A problem of the week (PoW) was presented on WebCT, and each preservice teacher had to comment on answers given to the PoW, by at least 5 different students. These comments were first perused by the instructor, with suggestions for improving the comments, then revised by the preservice teachers, and finally sent out to the students. Lessons learned from this online mentoring experience, both by the instructor and the preservice teachers, will be shared.

Session 11

Room: Argenta West

What Do You Know About a Triangle?-- An Investigation of Geometric Understanding

Dr. Robert Mann, Western Illinois University

Several students at various grade levels and their teachers were asked the open-ended question "What do you know about a triangle?" Their interesting responses will be shared along with some analysis and conclusions. Much of the session time will be devoted to a discussion on what should students and teachers know about a triangle and how the answer to this question impacts our classrooms, teaching practices, and professional development experiences.

Sessions 12-16

11:05 AM – 11:55 AM

Session 12

Room: Silver City VII

Classroom Assessment in Mathematics

George Bright, University of North Carolina-Greensboro

With support from NSF (grant #9819914) we have created a professional development program on classroom assessment for mathematics teachers in middle grades and high school. The core program is 30 hours, and there are three, 10-hour extension modules. This session will include the research grounding for the program and a brief overview on the main components.

Session 13

Room: Arkansas Diamond

Statistical Understandings of Preservice K-12 Teachers

Tamara Carter, Texas A & M- College Station

Robert M. Capraro, Texas A & M- College Station

In recent years, more emphasis has been placed on the data analysis strand of mathematics in grades K-12. The results from a study of pre-service teachers' understandings and misconceptions of data analysis as well as their attitudes towards statistics will be explored. Implications for teacher preparation programs will be discussed.

Session 14

Room: Arkansas Traveler

Investigating Probabilistic Intuitions

Dr. Robert J. Quinn, University of Nevada-Reno

Misconceptions regarding fundamental concepts of probability are common even among the relatively educated. In this session, data from an experimental study designed to gather information regarding the probabilistic intuitions of college students enrolled in a general teaching methods class will be analyzed and discussed. An important characteristic of the instrument used in this study is that participants are not only asked to answer questions involving probability but they are asked to explain why they think their answers are correct. The analysis of the data leads to several interesting categories of response and provides insight into many commonly held misconceptions regarding the nature of independent events. The conclusion drawn from this investigation should be informative to teachers of probability and statistics at all levels as they attempt to remediate common probabilistic misconceptions and devise more effective teaching strategies. Further, the research provides an interesting extension to the premise that the teaching of the theory of probability should be done in tandem with empirical experiences. This session will conclude with a discussion of potential directions for further study suggested by this research.

Session 15

Room: Silver City IV

Teachers' Voices: Factors That Impede and Support Productive Teaching of Mathematics

Kay A. Wohlhuter, University of Minnesota-Duluth

As part of a larger project that examined teachers' and principals' views about the productive teaching of mathematics, this research focused on beginning elementary and secondary teachers' views. Specifically, this presentation will discuss teachers' ideas about factors that impede and support productive teaching of mathematics as well as describe teachers' ideas that identify what is needed to promote the productive teaching of mathematics.

Session 16

Room: Argenta West

Things We Used to Know--The Continuing Effort to Make Mathematics Educators Aware of Their History

David Boliver, University of Central Oklahoma

While we welcome any new, high quality research which may result from the No Child Left Behind era in our profession, the rhetoric accompanying this thrust seems to suggest that there is no mathematics education research of value in our past. We will demonstrate by example that this is not true and we hope to accomplish two things: 1) Suggest new directions in mathematics education research which are grounded in the significant studies of the past; and 2) Foster a network of linked web pages on the history of mathematics education research.

Lunch Business Meeting

Noon – 1:30 PM

Welcome
Report of the Secretary
Approval of the Posted 2004 Minutes
Report of the Treasurer
Report of the Membership
Report of the Past President
Report of the Vice President for Conferences
Conference 2006
Report of the Vice President for Publications

Business Meeting Agenda

Website Information
FOCUS
Intersecting Points
Outgoing Presentations
Old Business
New Business
From the Floor
Adjournment

Sessions 17-21

1:30 PM – 2:15 PM

Session 17

Room: Silver City VII

Complexity of Transforming Mathematics Education in the Context of South Africa

Roland Pourdavood, Cleveland State University

Ten years after liberation in South Africa, transforming mathematics education remains a daunting task. This research investigated the complexities and challenges of transforming mathematics classroom discourse that promote conceptual understanding in a K-7 urban school in the context of South Africa. The school's student population changed from predominately white before the 1994 election to predominately black Xhosa-speaking students in 2004. The language of teaching and learning is strictly English and most teachers cannot speak or understand Xhosa. Additionally, some Xhosa-speaking learners cannot clearly articulate their thinking and reasoning in English. This study demonstrates two mathematics classroom social interactions and illustrates how language and culture play a pivotal role in classroom discourse.

Session 18

Room: Arkansas Diamond

Integrating Service-Learning and Case Studies as Tools for Developing Mathematical Teaching Reasoning in Pre-service Elementary Teachers

Dr. M. Lynn Breyfogle, Bucknell University

Mathematics teacher educators recognize the need for experiences that develop pre-service teachers' ability to make judgments about students' understanding and in turn make decisions about the types of follow-up activities for the students (CBMS, 2001). This study was designed to investigate the movement in pre-service teachers' reasoning about teaching mathematics while participating in a course that used a case study methodology and required participants to write and discuss cases about a service-learning experience.

Session 19

Room: Arkansas Traveler

How Do We Address Pedagogical Issues in Problem Solving with People Who Are Not Problem Solvers?

Dr. Lynae E. Sakshaug, State University of New York- Brockport

The results of a study will be shared where preservice teachers were asked to solve a real-life time problem that fifth grade children were able to solve. We will look at samples of work from children and from preservice teachers, comparing their understanding. Then the participants in the session will be asked to discuss the implications for problem solving in the future and for teacher preparation.

Session 20

Room: Silver City IV

Student Questioning Strategies in a Problem-Centered Mathematics Classroom

Dr. Darlinda Cassel, Oklahoma State University

Anne Reynolds, Kent State University

We will present data from a second-grade problem-centered mathematics classroom, addressing types of questions students ask of one another as they make sense of each other's math during whole class discussions.

Session 21

Room: Argenta West

Teachers' Mathematics Beliefs: Relationships with Mathematics Education, Teacher Education and Society

Elizabeth Goldthwait, Kent State University

A review of literature relating teachers' beliefs concerning the nature of mathematics with mathematics education. Questions concerning the differences between indoctrination and teaching in pre-service education are raised and related to Kegan's (1994) orders of adult development.

Sessions 22-26

2:25 PM – 3:10 PM

Session 22

Room: Silver City VII

How District Assessments are Impacting Mathematics Reform in the Boston Public Schools

Andy Carter, Roosevelt University

Four years ago the Boston Public Schools began a major mathematics reform initiative designed to strengthen mathematics teaching and learning across the district. This paper explores the role the district-wide assessments are playing in the initiative by focusing on the interactions that occurred in conjunction with the 2004 mid-year assessment (MYA). These interactions are analyzed from a situated perspective as occurring within district communities of practice where the MYA serves as a focal point on communication or boundary object. Thus, in seeking to understand the impact of the MYA it is necessary to take into account the diverse histories and perspectives of teachers as implementing agents, the constraints and affordances of the social contexts within which they operate, and the policy directives which have been developed by the district mathematics office. The purpose of this paper is to add to our understanding of the role of assessment in systemic mathematics reform.

Session 23

Room: Arkansas Diamond

Pre-Service Math Teachers Become Full Participants in Inquiry Investigations

Jennifer Wilhelm, Texas Tech University

Kendra Walters, Texas Tech University, Student

This presentation describes inquire-based environments in mathematics methods courses where pre-service teachers were expected to pursue their own conjectures, collect data, think critically, and communicate findings. Students displayed through their inquiry investigations an increased ability of communicating what they do know, and questioning what more they need to know by coupling their experiential learning with opportunities to construct new thoughts and questions. They looked for patterns and relationships and were beginning to discover a "reality connection" between theoretical ideas and the real world.

Session 24 Room: Arkansas Traveler
The Role of Technology in Teaching Geometry
James Telese, University of Texas-Brownsville

This paper reports on a literature review of the role technology plays in teaching geometry. The review discusses how technology can impact learning and teaching of geometric concepts. Implications for teaching will be presented.

Session 25 Room: Silver City IV
Experiencing "Authenticity" in Mathematics
Gabriel Matney, Oklahoma University

This presentation will look at data collected from secondary students on their experiences of authentic learning in mathematics. After a consideration of the way "authenticity" is used in the literature there will be a discussion about the meaning of "authenticity" in light of the student data.

Session 26 Room: Argenta West
Girls (and Boys) Just Wanna Have Fun
Shelli A. Brasher, Shelby County Schools- Memphis TN

Implementing gender-friendly activities can benefit all students. Learn how a system's experiences with an NSF Gender Equity Program is changing attitudes in the classroom and providing new opportunities for community involvement. Become familiar with community resources and classroom strategies that inspire students to question and explore scientific and mathematical applications.

Sessions 27-31

3:20 PM – 4:05 PM

x Session 27 Room: Silver City VII
Mathematics Education Reform: One Building at a Time
Dr. Daniel Brahier, Bowling Green State University

In this presentation, we will explore the process of reforming the teaching of mathematics in elementary and middle schools. Steps taken and collected data from several projects involving the implementation of reform curriculum and professional development of teachers and the impact of these programs will be shared. Participants will be encouraged to share examples of similar projects in which they are involved as we discuss the most effective ways to bring about school change.

Session 28 Room: Arkansas Diamond
Preparing Elementary Teachers to Teach Algebra- A 12-month Program
Sue Brown, University of Houston- Clear Lake

This session will describe a 12-month program developed to prepare elementary teachers to teach algebraic concepts. Course syllabi and resources will be shared. In addition, the effect of the program on teacher's concept and pedagogical knowledge will be discussed. Post-observation of classroom teaching and examples of children's work with algebraic concepts will be presented.

Session 29 Room: Arkansas Traveler
Using Dynamic Software to Teach Geometry in Mathematics Education Classes
Eileen Durand Faulkenberry, Texas A&M -Commerce

This presentation will be designed for elementary

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geometry courses

Session 30

Room: Silver City IV

Assessing Concept Maps: The Beginnings of a Literature Review

Mary B. Swarthout, Sam Houston State

One of the difficulties in using concept maps in the teaching and learning of mathematics is deciding how to assess them. Many approaches appear in the research literature in mathematics and science education. This presentation will share relevant research on concepts maps with the goal of identifying best practice for evaluation. Sample concept maps will be shared to illustrate how the variety of approaches from the research literature can be applied and to simulate discussion on the topic.

Session 31

Room: Argenta West

Making Sense: Accommodating a Multi-Age small Group

Sandra Davis Trowell, Valdosta State University

This presentation will discuss how a small group of elementary aged children - currently first grade through fourth grade - has assembled to learn and make sense of mathematics outside a "traditional" classroom setting. As the students are of different ages, background experiences, and mathematical thinking, the focus has been upon choosing tasks to accommodate this variation as well as negotiating what it means to "do mathematics".

Sessions 32-36

4:15 PM – 5:00 PM

Session 32

Room: Silver City VII

Use of Examples from History of Mathematics and Science to Engage Students' Interest and Increase Academic Performance

David Davison, Montana State University-Billings

Kenneth W. Miller, Montana State University-Billings

Professional articles point to the benefits of using examples from the history of mathematics and science to enrich the teaching of these subjects. They stress the importance of placing the school curriculum in the context of the historical development of these disciplines.

In this presentation we will discuss ways of addressing the history of both mathematics and science in a curriculum that focuses on the integration of the two disciplines. By considering significant contributions in the history of science where the work embraces both disciplines, we believe students will connect the historical topics to their curriculum and find increased application to their achievement in mathematics and science.

Session 33

Room: Arkansas Diamond

Pre-service & In-service Teacher's Attitudes, Efficacy Beliefs, Characteristics, and Achievement

Dr. Sally Robison, ~~Florida Atlantic University~~

Research was conducted with elementary pre-service teachers enrolled in two different teacher preparation programs in Florida. Many of the pre-service teachers enrolled in both programs had matriculated through the community college system, were non-traditional students, had weak mathematical backgrounds, and often times faced repeated failures on math sub-tests. This session will share findings regarding the relationships between pre-service teachers' math experiences, their performances on math tests, and their math attitudes and efficacy beliefs.

Session 34

Room: Arkansas Traveler

Appropriate Technology Supporting Meaningful Mathematics

Dr. Keith Adolphson, Ph. D., Eastern Washington University

Pre-service elementary education students often have a vary narrow view of mathematics. Technology can provide a vehicle to cause them to reconsider those ideas. This presentation discusses a study involving the appropriate use of technology to construct meaningful learning contexts for pre-service elementary education students.

Session 35

Room: Silver City IV

Supplemental Instruction-Does It Work?

Dana Craig, University of Central Oklahoma

Supplemental Instruction (SI) is an assistance program that is designed to improve course grades and increase student retention through the use of collaborative learning techniques. This study examined SI in two College Algebra classes.

xSession 36

Room: Argenta West

NIMS-Northwestern Illinois Mathematics and Science Partnership-In the Middle Working with Teachers

Alan Zollman, Northern Illinois University

This is a report of a partnership grant (US DOE) to improve mathematical problem solving and scientific inquiry for grades 3-5 teachers and students in the NCLB Act's Academic Early Warning List Schools. This is a sharing of information, procedures, activities, and preliminary results of the partnership. This report is specifically on the 20 3rd-5th grade teachers whose schools are on the No Child Left Behind Act's Academic Early Warning List in Illinois. Our approach is, by increasing the content knowledge and teaching skills of late-elementary teachers, their students' mathematics knowledge also will increase.

Special Session: Quilters

5:00 PM – 5:45 PM

Room: Silver City VII

Mix It Up--Arkansas, Mathematics, and Quilts

Jaynette Huff, Master Quilter

These 3 seemingly unrelated topics are blended together in this presentation by Jaynette with her quilts. We will learn a bit about the state of Arkansas and the Ozarks through various quilt block designs and patterns; see how mathematics flows through the whole quilting process and experience the beauty of fabric, thread, color and hours of labor lovingly woven together in quilts.

Dinner and Keynote Speaker

6:00 PM – 7:30 PM

After dinner our Wilson Lecturer, Dr. David Peterson, professor of mathematics at the University of Central Arkansas, will present mathematics, music and dance. David and his wife, Donna, are notable in Arkansas for their knowledge of Ozark music and dance. Dr. Peterson has presented many papers at professional meetings on the mechanic properties of musical instruments - hammered dulcimers, marimbas, and ocarinas. He also builds instruments and performs in various bands. One interesting part of his lecture will be on the way music is processed by the brain and why and how humans and other animals respond to music. One response is dance. And of course, mathematics can be used to describe dance and rhythm. David and Donna will demonstrate various instruments, musical styles, and dance. You will enjoy this lively form of mathematics.

Saturday, February 26, 2005

Continental Breakfast

7:00 AM – 8:30 AM

The Harmful Effects of Teaching "Carrying" and "Borrowing"

Dr. Constance Kamii, University of Alabama- Birmingham

Many data will be presented to show and explain why children who were taught to "carry" and to "borrow" did much worse than those who were encouraged to do their own thinking (to solve multidigit addition, subtraction and multiplication problems).

Sessions 37-41

8:30 AM – 9:15 AM

Session 37

Room: Silver City VII

Young Children's Artwork as a Reflection of Mathematical Understanding

Pat Lamphere Jordan, Oklahoma State University

The artwork of young children from ages 2 to 8 often reflects their understanding of their world. This study attempts to compare the details in young children's artwork to their knowledge and understanding of mathematics concepts. Children were given several Piagetian-like tasks to complete and then asked to draw a series of pictures. An interpretation of the knowledge the children demonstrated about mathematics through completion of the task was compared to the details in the children's pictures. Concepts represented in the artwork reflects knowledge about number, comparison, pattern, shape, and size.

Session 38

Room: Arkansas Diamond

Examining the Originations of Aversions Toward Mathematics Affecting Non-Math, Non-Science Majors

Dr. Michael J. Simmers, University of North Dakota

A large portion of the college student population often struggle with learning pre-calculus mathematics. There are a multitude of reasons why students struggle with mathematics, one of which is having a general dislike, or often expressed hatred, of mathematics. When students enroll in mathematics courses with preconditioned judgments, it is quite likely to affect their confidence and success rate in the course. This study investigates the origins of when, where, and why the aversion to mathematics began for students.

Session 39

Room: Arkansas Traveler

An Analysis of Knowledge Co-Construction Among Mathematics Teachers in an Online Environment

Jennifer Luebeck, Montana State University

Distance learning modalities, particularly computer-mediated conferencing (CMC), have opened up new pathways to higher-level thinking via discourse, reflection, and negotiated meaning. This paper investigates the use of CMC in the context of

Sorry—Session Cancelled

graduate-level co-constructed learning. The use of CMC in the context of graduate-level co-constructed learning and observed interaction patterns. However, answers to questions regarding quality, content, and cognitive level are more elusive. The researcher has applied an interaction analysis model designed by Gunawardena, Low, and Anderson (1997) to investigate qualitative aspects of knowledge co-construction among online learners, both in terms of content-specific conceptual growth and in terms of increased co-construction activity over the course of an academic year.

Session 40

Room: Argenta East

Writing in Mathematics for Meaning

Dr. Virginia Keen, Miami University

Students were asked to create children's books with geometry content appropriate for first-grade students. Reader notes written on the last page demonstrated to what extent students understood the geometric ideas studied in their mathematics content course for prospective early childhood teachers. After instructor approval of the books, students read their books to first-grade students then reflected on what they learned through this experience. This presentation will include examples of books, reader notes, and student reflections as evidence of student misunderstandings and learning of mathematics. The value of writing in mathematics for students and teachers will be considered.

Session 41

Room: Argenta West

Problem Solving Discourse: A Case Study of Four Ninth Grade Mathematics Students

Reza Ross Pourdavood, Langston University

The intention of this study was to examine complex interplay among four ninth-grade mathematics students' beliefs, problem solving engagement, problem type, and mathematics understanding as well as dynamics within group discourse. This study aimed to provide insight into the relationship that existed between students' engagement and problem type they chose to solve. In addition, the research explored how participants' problem solving discourse evolved as they engaged in a collaborative problem solving environment. The conference participants will be provided opportunities to engage in discussion related to their experiences regarding mathematics classroom discourse that promotes understanding.

Sessions 42-46

9:25 AM – 10:05 AM

Session 42

Room: Silver City VII

College Algebra Reform: The Report of an Attempt

Dr. Diana S. Perdue, Virginia State University

This presentation will describe a current reform effort designed to improve students' performance in the two-semester college algebra/trigonometry sequence that is part of the core curriculum at an HBCU (Historically Black college or University). The need for reform will be described, the nature of the reform effort will be detailed, and current data regarding the effectiveness of the reform will be given.

Session 43 Room: Arkansas Diamond
A Geometry Module for Mathematics Teachers
Elaine Young, Texas A&M -Corpus Christi

We will share our research from a grant-funded state geometry module used as a graduate mathematics course for pre-service/in-service teachers for grades 6-12.

Session 44 Room: Arkansas Traveler
Listening as an Integral Part of an Emergent Mathematics Curriculum
Stacy Reeder, Ph.D., Oklahoma State University
Dr. Darlinda Cassel, Oklahoma State University

Results of a qualitative study on emergent mathematics curriculum in both an elementary classroom and a middle school algebra and pre-algebra classroom will be presented. The role of listening as an integral part of both these classrooms will be highlighted through classroom transcripts.

Session 45 Room: Argenta East
Using Information Technology to Enhance Teaching Quality and Improve Student Achievement in Mathematics
Carolyn Pinchback, University of Central Arkansas
Carolyn Williams, University of Central Arkansas

This presentation describes a staff development project for enhancing teacher knowledge and student achievement and how the use of a web-based information technology is incorporated to assess, train and evaluate its effectiveness.

Session 46 Room: Argenta West
Creating Desirable Difficulties
William Speer, University of Nevada-Las Vegas

Sometimes learners express a reluctance to look at mathematics in an alternative way to their initial exposure to the topic. Pleas of "You're confusing me!" may actually signal an unrecognized confusion that is ALREADY present. There are many benefits to be gained by creating DESIRABLE DIFFICULTIES designed to enhance both long-term retention and transfer. Out of apparent chaos and confusion emerges a deeper understanding and appreciation.

Sessions 47-51

10:15 AM -- 11:00 AM

Session 47 Room: Silver City VII
Real-life Connections Help Students with Mathematics Learning Problems
Dixie Metheny, Montana State University- Billings
Johanna Hadden, Montana State University- Billings

The presenters have been exploring how real-life connections help students with mathematics learning problems. Activities we used will be described as well as changes in the students' mathematical understanding.

Session 48

Room: Arkansas Diamond

Analyzing Solution Strategies Among Different Populations to a Constructivist Pattern Problem

Dr. Robert J. Quinn, University of Nevada-Reno

Pattern recognition is a critical component of success in mathematics. Students at all levels should be provided with opportunities to investigate and uncover patterns throughout their mathematical careers. Further, they should be allowed to explore situations in which pattern recognition plays a vital role in the construction of important mathematical knowledge. In this session, participants will engage in a constructivist lesson that introduces arithmetic sequences through a simple, yet rich exploration.

Session 49

Room: Arkansas Traveler

Neither Equal nor Equitable: Implementation of the NCTM Standards with African American Students

Angiline Powell, University of Memphis

This session will look at African Americans and the implementation of the mathematics standards in their classrooms. It will trace the history of education of African Americans post civil war to the present. Specific attention will be paid to the standards and African American learning styles.

Session 50

Room: Argenta East

The Coaching/Mentoring Relationship: What Does Each Partner Gain?

Jean McGehee, University of Central Arkansas

Linda Griffith, University of Central Arkansas

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 focus in this presentation is the description and categorization of teacher responses to the coaching/mentoring relationship formed with university faculty and participating teachers. We will also describe the coaching moves that the university faculty make as they work with teachers

Session 51

Room: Argenta West

Concepts of Mathematics and Mathematics Teaching and Learning: Contrasts and Conflicts

Donna H. Foss, University of Central Arkansas

This paper has two primary objectives:

1) Identify the contrasting and conflicting conceptions of mathematics and mathematics teaching and learning held by methods instructors of elementary and secondary preservice teachers in their respective methods courses and

2) Propose methods of resolving the conflicts that restrict the preservice teachers' acquisition of pedagogical content knowledge and limit their adopting standards-based teaching. This interactive session will pose questions to the audience in groups so that the research results will be revealed, prompting a discussion of ways to resolve the conflicts.

Session 52

Room: Silver City VII

The Importance of Logic in Computer Science

Carolyn Pinchback, University of Central Arkansas

Singh Tomer, Univ

Sorry—Session Cancelled

This presentation discusses the importance of logic in computer science as it relates to their mathematics background during high school and college and the effect this background may or may not have in computer science.

Session 53

Room: Arkansas Diamond

Learning About Teaching Mathematics Through Critical Incident Reflection

Joanne E. Goodell, Cleveland State University

In this paper, I report the results of a four-year study into how my students learn to become mathematics teachers during the combined 15-week methods and field placement course I teach. At the start of most weekly methods class meetings, groups of three or four students report to the whole class. Each student then submits a written report of ten critical incidents for grading. At the end of the semester, I administer a questionnaire about the usefulness of each of the elements of the course. Using these two main data sources, along with my own personal reflections on the course, this paper answers the question "What are the critical incidents preservice teachers encounter during their field experiences, and what do they learn about teaching for understanding through reflecting on those critical incidents?"

Session 54

Room: Arkansas Traveler

A Colorado Lesson Study Project

Helen Gerretson, University of South Florida

Sorry—Session Cancelled

Elementary students' understanding of multiplication as related to basic facts. The findings of this research may be used to inform the developmental stages of multiplicative thinking.

Session 55

Room: Argenta East

Professional Development for Pre-service and Novice Educators

Dr. Winifred Mallam, Texas Women's University

The Texas Collaborative for Excellence in Teacher Preparation (TxCETP) is committed to the recruitment, education, and retention of the next generation of mathematics educators. As one of their activities, TxCETP provides opportunities for pre-service educators to enhance in-class instruction. This session will describe some of the enhancement activities, e.g. museum visits and conferences.

Session 56

Room: Argenta West

Prospective Elementary Teachers' Visual Images of Teaching Mathematics

Juliana Utley, Oklahoma State University

Betsy Showalter, Lankston University

Research will be presented that focuses on prospective elementary teachers' visual images of themselves as mathematics teachers. Drawings made by prospective elementary teachers were analyzed to reveal these prospective elementary teachers' self-perceptions and for the language used in descriptions to refer to the teacher in the drawings for indicators of teacher vs. student-centeredness. The drawings revealed that 82% of the prospective elementary teachers' drew a female teacher and 71% of them do not yet identify themselves as the teacher. Findings also showed that the majority of prospective elementary teachers still envision a classroom that is more teacher-centered than student-centered despite efforts of teacher preparation programs to effect a change in thinking.

Lunch

11:45 AM – 12:45 AM

Excursion to Clinton Library

1:00 PM – 5:30 PM

Meet in Wyndham lobby at 1:00.

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