

MUS

OF



MATHEMATICS

RCMIL Conference March 7-9, 2002



Conference Program Chairman

Sheryl A. Maxwell

College of Education The University of Memphis Memphis, Tennessee

Research Council on Mathematics Learning

2002-2003

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Research Council on Mathematics Learning

seeks to simulate, generate, coordinate, and disseminate research efforts designed to understand and/or overcome factors that inhibit maximal mathematics learning.

Research Council on Mathematics Learning Conference

Thursday, March 7, 2002

Time	Activity	Room
8:00 - 5:00	Conference Registration	Atrium area
12:00 - 3:30	RCML Executive Board meeting	Exec. Boardroom
4:00 - 5:00	Cash Bar Reception w/appetizers	2 nd Floor Foyer

Keynote #1

5:00 - 6:00

Welcoming Remarks -- Dr. John Schifani, Interim Dean, College of Education

John Evans

(Former Box Tops artist)

Memphis, Mathematics, and Music

6:00 - 12:00 Seeing Memphis On Your OWN Dinner and Activities

Memphis area

Page 1

Crump

Friday, March 8, 2002

Time	Event	Description	Room
7:00-7:50	Breakfast	Breakfast Buffet Menu	2 nd Floor
		CdynMi webrydT	Foyer

Keynote #2

8:00-9:00

Welcoming Remarks -- Dr. Ralph Faudree, Professor of Mathematics, & Provost, University of Memphis

Overton

Jerry Becker

(Southern Illinois University)

Developing Computational Skills in Contexts of Problem Solving

	Friday	Presente	r Topic/Abstract	Room
1)	9:10 -10:00	Mary Shafe	Teaching for Understanding: Profiles of Teachers' Interactive Decisions	Hicks
		Abstract:	This presentation details methodologies developed to analyze the nature of teachers' interactive decisions with respect to practices that promote teaching mathematics for understanding. Particular attention is given to teachers' explanations, changes in instructional tasks and shifts in pedagogical approach. Profiles of such decisions were constructed to examine differences among teachers.	
2)	9:10-10:00	Dana S. Cra	ig Service Learning Projects for Mathematics Education Majors	Banks
		Abstract:	This session examines the innovative use of service learning projects in the methods course for secondary mathematics education majors. Discussion will include student learning, mathematical content, pedagogy, implementation, and preliminary results.	

man	Friday	Presenter	Topic/Abstract	Room
3)	9:10-10:00	Winifred A. Mallam	Integrating Technology in the Liberal Arts Mathematics Curriculum	Exc. Boardroom
			The session will describe how a spreadsheet program can be used to demonstrate compound interest, an amortization schedule, and average daily balance for a month. Results of students' attitudes toward using the spreadsheet when solving consumer mathematics problems will be presented.	
1)	0.10 10.00	Malfried Ole	on Durfacional Davids and Land Land	D: C:
4) 9:1	9:10-10:00	Melfried Olse		River City
		Judith Olson		#1
			Teachers (Grades 5-8) who participated in an NSF funded professional development program in Algebra and geometry, generated assessments to	
			ask students across grade levels and between schools in an effort to grasp	
			students' understanding of mathematical concepts in algebra and geometry. Teachers' attitudes toward mathematics and their understanding of mathematical ideas were also assessed.	
5)	9:10-10:00	Mary Marga	ret Measuring One Factor for Preservice Teachers'	Iris
		Capraro, Robert M.	Propensity toward Teaching Elementary/Middle	
		Capraro,	School Mathematics: Pedagogical Content	
		Gerals Kulm	Knowledge	
			Teaching mathematics requires knowledge of content and pedagogy, and the understanding of the relationship between the two. Presenters will discuss how one institution is assessing preservice teacher performance in mathematics.	
6)	9:10-10:00			D' C'
6)	9:10-10:00		Robotics: Developing Opportunities for Emergent	River City
		Adolphson, Stacy Reeder	Mathematics	#2
			Research focusing on students' development of mathematical knowledge as it emerged in the context of constructing and	
			programming autonomous robots will be presented. The opportunities	
			for students' mathematical understanding as they engaged in authentic, open-ended problem solving inherent to the challenges associated with	
			robotics will also be highlighted.	

	Friday	Presenter	Topic/Abstract	Room
		MA Lastel side	To no Teamwell A. Federating Technology U.	
7)	10:15-11:05	Robin A. Ward, Cynthia Anhalt	Prospective Elementary Teacher's Development o Mathematical Pedagogical Knowledge	f Hicks
		math their docu	andy was carried out in which preservice teachers enrolled in a K-8 mematics methods course were videotaped to (1) gain insight into thinking about the teaching of mathematical topics, and (2) ment their pedagogical development throughout the semester. Order reflecting their thoughts and ideas will be shared.	
8)	10:15-11:05	Kay Reinke,	The Development of an On-Line Mathematics	Banks
		math	Education Course presentation looks at the process of the development of an on-line ematics education course, including the implementation and sment of its effectiveness.	Banks
9)	10:15-11:05	Pat Lamphere	Secondary Education Students' Conceptual	River City
		Jordan	Understanding of Geometry and Measurement	#1
		by sec conce	assion of the results of a study focusing on the misconceptions held condary preservice teachers in geometry and measurement upts, the activities that were implemented to address these unceptions, and the follow-up assessment.	
10)	10:15-11:05	Jim Telese	Communication in United States Eighth-grade Mathematics Classrooms: A TIMSS-R Analysis	River City #2
		comm grader that le	tudy examines the relationship between features of nunication and US eighth-graders' achievement level. The 8th is self reported results show indicate some insightful components and to how middle school mathematics classroom learning numents could be enhanced.	
11)	10:15-11:05	Angela Grant	Contrast of Traditional Lecture versus Self-	Exc.
			Paced Elementary Calculus	Boardroom
		studen two di self-pa	alk contrasts the demographics and success of undergraduate ts at the University of Memphis taking Elementary Calculus in stinct formats: traditional lecture vs. self-paced sections. The ced sections are web-enhanced, tutor assited, and use self-guided poks. I discuss Final Exam scores as a gage of learning retention.	
12)	10:15-11:05 V	Working Group #1	Teacher Education and/or Curricular Issues	Iris
	leH .		Individuals attending this session will be networking with others across the nation to plan collaborative research.	

		Time	Presenter	Topic/Abstract	Room
1	3)	11:10-12:00	Jeffrey E. Barrett	Using a Framework for Learning Measurement to Change Instruction	River City
			measu a men that pr	tudy describes second-grade children's ways of learning length arement in a classroom setting while the teacher was working with tor. We examined children's way of thinking and learning during rocess. This type of classroom intervention led children to attend directly to abstracted units of length.	
1	4)	11:10-12:00	Kay Wohlhuter	Preparing Tomorrow's Teachers to Use	Hicks
				Technology: A Mathematics Collaboratory	
			educat mathe impler	aboratory consisting of a classroom teacher, A mathematics tor in an education department, a mathematics educator in a matics department, and three education students plan and ment technology infused units. This session will briefly describe erall project and address the work completed by the team.	
1	5)	11:10-12:00	Charles Wallis	Classroom Assessment in Mathematics, Grades 4-12	Banks
>			works use of	ssion of a current NSF-funded project on the development of hop materials that support and extend teachers' understanding and classroom assessment in mathematics, specifically the assessment dent thinking and the use of that knowledge to inform instructional ons.	
1	6)	11:10-12:00	develo	Potential Relationship Between Mathematics Learning and Motor Development e a connection between mathematics learning and physical motor opment? This session will discuss a pilot study designed to igate this question.	River City #2
1	7)	11:10-12:00	Aimee L Govett, Cynthia Hernon	The Efficacy of Integration of Secondary Math and Science Methods in Preservice Teacher	Exec. Boardroon
				Education	
			their s mini-f planne	resenters created a teacher education learning community within econdary math and science methods courses. They designed field experiences, facilitated electronic discussion boards, and ed a Desert Wetlands field trip to encourage preservice teachers to connections among math, science, and technology.	

	Friday	Presente	r Topic/Abstract	Room
18)	11:10-12:0	O Jeff Bulingto Abstract:	n Controlling the Center: Chess and Strategic Spatial Reasoning A practical look at how chess strategy impacts the ways in which students approach related mathematical problems.	Iris
19)	11:10-12:0	0 Working Gro	oup #2 Technology, Tools & Strategies, and Learning	Overtor
	all .	self of eller	Individuals attending this session will be networking with others across the nation to plan collaborative research.	
	12:00-1:15	Lunch Provid	ded Chicken Teriyaki	Crump
		ina mily surface may ying di law gasa	Marinated and Grilled Breast of Chicken, Served on a Bed of Fried Rice with Stir Fried Vegetables	
istni	1:15-1:45	RCML Busine Meeting	ess Virginia Usnick - President	Crump
	Friday	Presenter	Topic/Abstract	Room
20)	2:00-2:50	William R. Speer	Mathematics and Science Enhancement A Project's Description and Promise	Iris
		in in an	NSF grant with mathematics, science, and technology for K-5 schools the sixth largest school district in the country will be highlighted, cluding the parameters of a standards-based, inquiry-oriented project at the participation of teachers and principals in the collaborative hools that are taking part.	
21)	2:00-2:50	Margie Mason	Using Performance-Based Tasks to Assess the van Hiele Levels of K-8 Students	Exec. Boardroom
		ass the the	eter viewing videos of K-8 students performing tasks designed to seess the van Hiele levels of geometric understanding, we will explore to use of classroom assessment techniques such as these interviews and the implications, strategies for basing instruction on such assessments, decommon geometric misconceptions.	

22)	2:00-2:50	Azita Manouchehri,	Is College Algebra for ALL? The Challenge of Reforming Perspectives	Hicks
		Roger Solis,		
		5	Results of a conceptual test measuring the algebraic thinking of nearly 400 college algebra students' skills in areas emphasized by the algebra strand of the NCTM's Curriculum Stands. The college algebra instructors' reflections on the research results will also be discussed.	
23)	2:00-2:50	Gale A. Watso	n Small Group Activities and Their Use to Promote Mathematical Understanding	Banks
		t a	This presentation includes a report on the use of small group activities and procedures that promote classroom discussion of mathematical topics. Group quizzes, design of worksheets, questioning techniques, and student reactions will be shared. Worksheets for both College Algebra and Business Calculus topics will be included.	
24)	2:00-2:50	Lynae E. Saksl	haug Teaching a Graduate Math Methods Course Partially On-line: Design and Results	River Cit
		F C t	The design and results of teaching a graduate math methods course partially on-line will be shared. Goals were that students would interact on-line, community would be promoted, students would use technology to enhance understanding of mathematics, and students would engage in meaningful learning on-line <i>Angel</i> software was used.	
25)	2:00-2:50	Johnny Lott	Mathematics Models with Technology: How to Assess	River Cit
		s	Mathematics modeling with technology is a class that prospective secondary mathematics teachers take at The university of Montana. The class deals with appropriate problems that can be approached with models, technology, and assessed.	
26)	2:55-3:45	Alan Zollman	Making Connections: Helping Students Reflect on Their Mathematics Content	Iris
		c v n	Students view mathematics as a list of topics to learn, rather than as a connected, single discipline. "Algebra" in high school is not associated with the "algebras" of linear algebra or abstract algebra by secondary najors. Elementary majors do not connect measurement, probability, and proportion problems as possible area representations.	

mo	Friday	Presenter	Topic/Abstract	Room
27)	2:55-3:45	Bea Babbitt	Using Performance-Based Tasks to Assess the van Hiele Levels of K-8 Students	Exec. Boardroom
		Abstract:	After viewing videos of K-8 students performing tasks designed to assess the van Hiele levels of geometric understanding, we will explore the use of classroom assessment techniques such as these interviews and their implications, strategies for basing instruction on such assessments, and common geometric misconceptions.	
28)	2:55-3:45	Sue Brown	Assessing Grant Students' Content and	Banks
			Pedagogical Knowledge of Mathematics Kindergarten, first, and second grade teachers participated in a twelve month mathematics inservice program. This session describes how we assessed the Grant students' content and pedagogical knowledge of mathematics.	
29)	2:55-3:45	Judith M. Flowers, Angela Kreb	Preservice Teachers' Understanding of Number in a Standards-Based Course	River City #1
			Presenters describe an innovative Standards-based content course for preservice teachers. They will discuss their preliminary findings from research that looks at the reasoning and understanding participating preservice teachers have about whole number relationships and operations.	
30)	2:55-3:45	Masoud Ghafi Roland Poura	,	Hicks
		salvenity of Mortes the separation with	This presentation focuses on implications of the Trinity Paradigm of Intelligence in academic learning in general, and mathematics learning in particular. It describes why such a holistic approach is needed. In addition, creativity and intuition in learning and factors impeding their development will be discussed.	
31)	2:55-3:45	John Selisky	Authenticity and Test Items in Large-Scale	River City
		on search, on the distribution of the control of th	Assessment - What is authenticity in assessment? Are so called authentic items demonstrably better at measuring student performance than other types of items? By examining some student performance data, we can explore ways to answer some of these questions and help teachers and teacher educators better understand the relationship between instruction and assessment	#2

and assessment.

3:45-3:55

Refreshment Break

Hallway

Time

Activity

Room

Overton

Keynote #3

4:00-5:00

John Wilson Memorial Address

Dr. Stephen T. Kitai, Ph.D.

Director, Neuroscience Institute

How Does the Brain Control
Movement: By the Number or
by Trial and Error?

6:00-12:00

Activities in the Community of Memphis A bus will leave at 6:00 for Beale Street, returning to the hotel by midnight. The cost is just \$12.00 per person.

Beale Street area

Saturday, March 9, 2002

7:00-8:00		Breakfas Provided	Di cuitable Daire	2 nd Floor Foyer
	Saturday	Presenter	Topic/Abstract	Room
32)	8:10-9:05	Sheryl A. Maxwell	Teaching/Learning Mathematics in the K-8 Block Format: Incidents and Insights	Exec. Boardroom
			An integrated course, designed about INTASC Standards, was developed when a new Integrative Studies Major replaced the former licensure program for elementary/middle school teacher candidates. The BLOCK, a professional education portion of the major, consolidated three formerly autonomous methods courses and two pedagogy courses into one 12 hour course, with four components. This session describes the teaching/learning of mathematics of all participants with insights shared.	
33)	8:10-9:05	Dixie Mether Abstract:	Integrating Technology in a Mathematics Class This session will discuss integrating appropriate technology in mathematics classes for both elementary and secondary teaching	Banks
			majors. The intent of the author is to seamlessly include both computers and calculators in her classroom so that the technologies enhance the learning of mathematical concepts.	
34)	8:10-9:05	Michael Meag	gher, Classroom Communication Systems and	River City
		Marlena Herr	nan How People Learn: Developing Pedagogy	#1
		Abstract:	This study is designed to investigate to what degree it is feasible, given the constraints of a typical one-week intensive inservice teacher enhancement institute, to teach high school mathematics teachers to use a Classroom Communication System (CCS), such as the TI-Navigator, effectively and make their teaching become more learner-center, knowledge-centered, assessment-centered and community-centered?	
35)	8:10-9:05	Conrad Van		Iris
33)	0.10-7.03	Voorst	Secondary Teacher Education	
		Abstract:	The purpose of this presentation is to share certain findings and insights of classroom research that engages prospective secondary teachers in problem-based discussions about the nature of teacher and student	

thinking about mathematics.

Abstract: Responses to conceptual math questions asked of elementary and secondary math methods students will be shared with the participants. Open discussion about additional questions and further research options will be welcome. 37) 9:10-10:00 Diana S. Mathematics Online: Preparing Teachers via Distance Boardro Abstract: How do you design a mathematics education course for online delivery? What are the advantages and disadvantages of distance learning compared to classroom learning? What are the differences in student performance and affect between the two delivery methods? Come investigate the answers to these questions and more during this presentation. 38) 9:10-10:00 Robert The ADAGE Approach to Mathematics and the Concept Mann of Function Abstract: This presentation will explain how the ADAGE approach to teaching mathematics can improve student math attitude and aptitude. The ADAGE approach will be described and research regarding the influence of this technology-enhanced methodology upon student understanding of the concept of function will be discussed. 39) 9:10-10:00 Sylvia R. Taube, Preservice Teachers' Use of Children's Literature Carolyn Pinchback Abstract: This presentation compares two groups of prospective elementary teachers (juniors and seniors) who were each assigned to develop and teach a mathematics lesson for grades 3-5 using selected children's		Saturday	Presenter	Topic/Abstract	Room
secondary math methods students will be shared with the participants. Open discussion about additional questions and further research options will be welcome. Mathematics Online: Preparing Teachers via Distance Perdue Learning Abstract: How do you design a mathematics education course for online delivery? What are the advantages and disadvantages of distance learning compared to classroom learning? What are the differences in student performance and affect between the two delivery methods? Come investigate the answers to these questions and more during this presentation. The ADAGE Approach to Mathematics and the Concept Mann of Function Abstract: This presentation will explain how the ADAGE approach to teaching mathematics can improve student math attitude and aptitude. The ADAGE approach will be described and research regarding the influence of this technology-enhanced methodology upon student understanding of the concept of function will be discussed. 39) 9:10-10:00 Sylvia R. Taube, Preservice Teachers' Use of Children's Literature Carolyn to Teach Mathematics #1 This presentation compares two groups of prospective elementary teachers (juniors and seniors) who were each assigned to develop and teach a mathematics lesson for grades 3-5 using selected children's	36)	8:10-9:05			River City #2
Abstract: How do you design a mathematics education course for online delivery? What are the advantages and disadvantages of distance learning compared to classroom learning? What are the differences in student performance and affect between the two delivery methods? Come investigate the answers to these questions and more during this presentation. 38) 9:10-10:00 Robert The ADAGE Approach to Mathematics and the Concept Mann of Function Abstract: This presentation will explain how the ADAGE approach to teaching mathematics can improve student math attitude and aptitude. The ADAGE approach will be described and research regarding the influence of this technology-enhanced methodology upon student understanding of the concept of function will be discussed. 39) 9:10-10:00 Sylvia R. Taube, Preservice Teachers' Use of Children's Literature Carolyn to Teach Mathematics #1 Pinchback Abstract: This presentation compares two groups of prospective elementary teachers (juniors and seniors) who were each assigned to develop and teach a mathematics lesson for grades 3-5 using selected children's			Abstract:	secondary math methods students will be shared with the participants. Open discussion about additional questions and further research options	
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literature hashe involving anomator, massurement and whale growhen			Abstract:	teachers (juniors and seniors) who were each assigned to develop and	
operations. Assessment results, lesson plans, and post-instruction reflections will be shared.					

	Saturday	Presenter	Topic/Abstract	Room
40) 9	0:10-10:00	Tisa M. Lach,	Using Math Games to Improve Spatial Sense and	Banks
10) 2		Lynae Sakshaug	Algebraic Reasoning	
		Abstract: The pu	arpose of this study was to determine whether playing math- games along with mathematics instruction improves students' to solve problems involving algebraic reasoning and spatial Using two fifth grade classes, one received mathematics	
		instruc	ction, while the other played games along with mathematics ction. Findings will be discussed.	
41)	9:10-10:00	Rama Menon	Elementary School Children's Number Sense	Iris
41)	y.10-10.00	Abstract: Result	ts of a study of number sense of more than 400 students from e 4 to Grade 8, based on a 10-item test, will be discussed. Some sthat might have influenced students' responses will be put	
42)	9:10-10:00	Genevieve Knigh Moderator	- 1 -/A Mothematics in the	River City #2
			Panel will discuss the problems and solutions of combining assessment with teaching and learning of mathematics. Participants are encouraged to ask questions.	
_	10:00-10:10		Refreshment Break	Hallway
43)	10:15-11:05	Jean J.	Large-Scale Assessment Combined with	Banks
70)	10.10 11.00	McGehee,	Curriculum Alignment: Agent of Change	
		mod	s study investigates the effectiveness of a professional development del based on coaching and alignment of the intended (written), the	(
44)	10:15-11:05	Abstract: This mod taug	s study investigates the effectiveness of a professional development del based on coaching and alignment of the intended (written), the ght, and the tested curricula. kk, Integrating Mathematics and Science in a	Iris

		Saturday	Presenter Topic/Abstract	Room	
45)		10:15-11:05	Michael Naylor Generating Excitement with Preservice Teachers Through Math Connections		
			Abstract: This lively and engaging talk describes a successful and motivating classroom experience in which students made connections between patterns in a problem solving activity and many areas of mathematics and music.		
4	16)	10:15-11:05	Mary B. Using WebCT: Lessons Learned for Teaching a Swarthout Learning Mathematics	and Hicks	
			Abstract: Presents information gathered during the use of WebCT in a mathematics content course for preservice elementary teachers. Examples of how the software was used to supplement and enhance classroom instruction together with examples of student work will be followed by the discussion of the role the web should play in courses future educators.		
4	17)	10:15-11:05	Art Johnson Assessing Adolescents' Knowledge of Similarity and Area	Exec. Boardroon	
9			Abstract: The study assesses adolescents' abilities to enlarge plan geometric figures on the basis of a scale factor of their areas. Subjects were dra from three course enrollment groups: Algebra I, Geometry, and Alge II. Three of eleven solution methods dominated the data results. Resindicate there were (1) no significant differences relative to strategy (pencil-paper versus use of software program), (2) poor recall of area	wn bra ults	
4	18)	10:15-11:05	formulas, and (3) weak understanding of the quadratic nature of area. Helen Gerretson Hands-on Mathematics for Nurturing Science Literacy	River City	
			Abstract: This presentation is a description of research focused on elementary school teacher professional development that supports student achievement. Elementary school teachers were given opportunity to thoroughly develop their knowledge of measurement concepts, thus enhancing their ability to implement mathematics as a tool of scientification.	ïic	
4	19)	11:10-12:00	Mary Enderson, Teacher Change: Is it Possible in Today's Lauren J. Wright Classrooms?	River City #1	
			Abstract: This presentation will focus on teacher change as it relates to the mathematics reform movement. The research has involved one high		

Page 13

how she has come to reach this point.

school math teacher's use of non-traditional forms of instruction and

	Saturday	Presenter	Topic/Abstrac	ct	Room
50)	11:10-12:00	di m le	Construction of Mathematical M	eaning of s of mathematical f problem-centered cal norms that	Hicks
51)	11:10-12:00	ei c: n	Mathematics A-Cultural and A his paper presentation focuses on three different a hnomathematics: (1) To revisit three take-for-graulture, mathematics and context, (2)To discuss the full cultural perspective, and (3)To propose a view athematical ideas within a context of multicultural perspective.	aspects of anted notions of e promise of a wpoint of	Banks
52)	11:10-12:00	P	Mathematics Teacher Educate a variety of assignments and evaluation rubrics warticipants will have an opportunity to discuss the elated efforts.	ion Programs	Exec. Boardroo
53)	11:10-12:00	Working Groups Wrap-up	recented under the state of the selected	cion/Curricular Issues	Iris River Ci #2

Time	Event	Description	Room
12:00-12:45	Lunch Provided	Chicken Fajita Salad	Crump
	effore templet	Grilled Marinated Chicken Breast, sliced and served over a Bed of Lettuce, with Grilled Vegetables and Peppers and topped with a three cheese blend. Served on a Crisp Flour Tortilla	
	Keynote #4		
12:30-1:30		James Segars	Crump
	F	ederal Express, Manager	
	Co	ncept System Form Design	
	Flying	Forward with FedEx	
And the same	is Costrol Mor	Executive Board Meeting	Exec.

Have a SAFE trip Home. See you next year!

Sessions to Attend

#	Time		Presenter	Title/Activity	Room
	R	5 - 6 pm	John Evans	Memphis, Mathematics, and Music	Crump
	F	8 - 9 am	Jerry Becker	Developing Computational Skills	Overton
1-6	F	9:10			
		10:00		maken. We also explain parke-mathematical floring limit	
7-12	F	10:10		Refreshment Break	Hallway
		10:15			
12-19	F	10:15			
		11:05			
	F	11:101			
		2:00			
	F	12:00		Lunch Business Meeting	Crump
20.25	-	1:45			
20-25	F	2:00			
26-31	-	2:50			
20-31	F	2:55 3:45			
	F	3:45		D C 1 A D 1	TT-11
	Г	3:55		Refreshment Break	Hallway
	F	4:00	Du CT Vitai	II D 41 D C 41 Movement?	Overton
	1	5:00	Dr. S. I. Kitai	How Does the Brain Control Movement?	Overton
100					
32-36	S	8:10			
		9:05			
37-42	S	9:10			
		10:00			
	S	10:00		Refreshment Break	Hallway
		10:10			
43-48	S	10:15			
		11:05			
49-53	S	11:10			
		12:00			
	S		James Segars	Lunch - Flying Forward with FedEx	Crump
		1:30		, ,	

Index

Name	Session	Institution	E-mail Address
Keith Adolphson	6	University of Oklahoma	kadolphson@ou.edu
Cynthia Anhalt	27	University of Arizona	anhalt@u.arizona.edu
Bea Babbitt	27	University of Nevada, Las Vegas	babbitt@unlv.edu
Jeff Barrett	13	Illinois State University	jbarrett@ilstu.edu
Jerry P. Becker	Key-#2	Southern Illinois University	jbecker@siu.edu
Rosemary Bernardi	mem	Deerfield, Illinois	N/A
David E. Boliver	52	University of Central Oklahoma	DBoliver@ucok.edu
Sue Brown	28	University of Houston, Clear Lake	browns@cl.uh.edu
Jeff Bulington	18	Oakhaven School, Memphis, TN	jandq@msn.com
Mary Margaret Capraro	5	Texas A & M University	mmcapraro@coe.tamu.edu
Robert Capraro	5	Texas A & M University	rcapraro@coe.tamu.edu
Nicole Carignan	51	UQAM, Canada, Dept. of Ed.	carignan.nicole@uqam.ca
Darlinda Cassel	50	University of Oklahoma	darlinda.cassel@oc.edu
Dana S. Craig	2	University of Central Oklahoma	dcraig@ucok.edu
Mary C. Enderson	49	Middle Tennessee State Univ.	mcenders@mtsu.edu
Judy Flowers	29	University of Michigan-Dearborn	jflowers@umich.edu
Helen Gerretson	48	University of Northern Colorado	hpg@unco.edu
Max Ghaffari	30	Cleveland State University	mxghaff@msn.com
Aimee Govett	17	University of Nevada, Las Vegas	govett@ccmail.nevada.edu
Angela Grant	11	University of Memphis	aggrant@memphis.edu
Linda K. Griffith	43	University of Central Arkansas	lindag@mail.uca.edu
Kim Hartweg	4	Western Illinois University	KK-Hartweg@wiu.edu
Edith Hays	Q=A0	Texas Woman's University	ehays@twu.edu
Marlena Herman	34	Ohio State University	herman.91@osu.edu
Cynthia Hernon	17	University of Nevada, Las Vegas	hernon@unlv.edu
Zhonghong Jiang	44	Florida International University	jiangz@fiu.edu
Art Johnson	47	Boston University	ajohnson@bu.edu
Pat Lamphere Jordan	9	Oklahoma State University	lampher@okstate.edu
Genevieve M. Knight	42	Maryland	ajohnson@bu.edu
Angela Krebs	29	University of Michigan-Dearborn	askrebs@umd.umich.edu
Keith R. Kull		University of Kentucky	kkull@earthlink.net
Tisa Lach	40	Webster Schools, NY	mtlach@MSN.com
Johnny W. Lott	25	University of Montana	jlott@nctm.org
Winifred A. Mallam	3, 19	Texas Woman's University	wmallam@twu.edu

Name	Session	Institution	E-mail Address
Barbara Manley		Jackson State Comm. College, TN	bmanley@jscc.cc.tn.us
Bob Mann	28	Western Illinois University	RR-Mann@wiu.edu
Azita Manouchehri	22	Central Michigan Universit	azita.m@cmich.edu
Margie Mason	21	The College of William and Mary	mmmaso@facstaff.wm.edu
Sheryl Maxwell	32	University of Memphis	smaxwell@memphis.edu
Jeanie McGehee	43	University of Central Arkansas	jeanm@mail.uca.edu
Michael Meagher	34	Ohio State University	meagher.10@osu.edu
Rama Menon	41	California State University, LA	rmenon@calstatela.edu
Dixie Metheny	33	Montana State University-Billings	dmetheny@msubillings.edu
Michael Naylor	45	Western Washington University	mnaylor@cc.wwu.edu
Judy Olson	4, 19	Western Illinois University	Judy_Olson@ccmail.wiu.edu
Melfried Olson	4	Western Illinois University	Melfried_Olson@ccmail.wiu.edu
Diana Perdue	37	Western Texas A & M University	dperdue@mail.wtamu.edu
Carolyn Pinchback	39	University of Central Arkansas	carolinp@mail.uca.edu
Roland Pourdavood	30, 51	Cleveland State University	r.pourdavood@csuohio.edu
Stacy Reeder	6	University of Oklahoma	stacyreeder@ou.edu
Kay Reinke	8	Oklahoma State University	kreinke@okstate.edu
Anne Reynolds	50	University of Oklahoma	areynolds@ou.edu
Sally Robison	36	Florida Atlantic University	srobison@fau.edu
Lynae Sakshaug	24, 40	SUNY-Brockport	Isakshau@brockport.edu
Vicki Schell	12	Lenoir-Rhyne College	vschell@lrc.edu
John Selisky	31	Riverside Publishing	jselisky@earthlink.net
Mary Shafer	1	Northern Illinois University	shafer@math.niu.edu
Bill Speer	20	University of Nevada, Las Vegas	speerw@unlv.edu
Mary Swarthout	46	Western Illinois University	Mary_Swarthout@ccmail.wiu.edu
Sylvia R.Taube	39	Sam Houston State University	edu_srt@shsu.edu
Jim Telese	10	University of Texas, Brownsville	jtelese@utb.edu
Ginny Usnick	16	University of Nevada, Las Vegas	vusnick@unlv.edu
Conrad Van Voorst	35	SUNY-Brockport	cvanvoor@brockport.edu
Charles Wallis	15	Western Carolina University	cwallis@email.wcu.edu
Robin A. Ward	7	University of Arizona	raward@email.arizona.edu
Gale Watson	23	Georgia Southern University	gawatson@gasou.edu
Kay A. Wohlhuter	12, 14	University of Minnesota, Duluth	kwohlhut@d.umn.edu
Lauren J. Wright	49	Middle Tennessee State Univ.	wrightlj@hotmail.com
Alan Zollman	26, 42	Northern Illinois University	zollman@math.niu.edu

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