Schedule and Abstracts for Breakout Sessions

AMS-MER Workshop on
Excellence in Undergraduate Education:
Mathematics for Teachers and Mathematics for Teaching
March 13-16, 2003, Ithaca College, Ithaca, NY

Breakout Sessions: Friday 1:30 - 2:30

Room: Clark Lounge

Presenters: Margaret Robinson, David Brown and Eric Robinson, Ithaca College
Title: *"Mathematics Teaching Program" at Ithaca College*
Abstract: We will provide details and interaction related to some features of the "Mathematics Teaching Program" at Ithaca College. Among the topics discussed will be the Explorations in Mathematics/Undergraduate Research thread in the major as it impacts the mathematical preparation of secondary teachers. We will also discuss the impact of the COMPASS program and the NCTM Principles and Standards on both the pedagogical and mathematical preparation of secondary teachers. Other features of the program will be highlighted as time permits.

Room: Klingenstein Lounge

Presenters: Roger Waggoner, Kathleen Lopez and Vic Schneider, University of Louisiana at Lafayette
Title: *Mathematics Preservice Content Courses at the University of Louisiana at Lafayette*
Abstract: The Mathematics Department at the University of Louisiana at Lafayette has a long history of providing mathematics content courses designed specifically for prospective teachers at the elementary and the secondary levels. Currently, a four-course mathematics sequence is required by, and restricted to, students seeking Grades 1-6 and middle school certification. Two additional mathematics courses are now necessary for middle school certification with mathematics as an in-depth teaching field. One of these, a four-hour proportional reasoning and problem solving course, will be developed this summer. Three other mathematics courses, Problem Solving, Abstract Algebra/ Number Theory, and College Geometry, have been designed primarily for the preparation of secondary teachers (Grades 7-12 certification).

In the plenary session, we gave an overview of our preservice mathematics program and discussed factors that contributed to its successful implementation. In the break out session, we will describe the goals, structure, and content of theses courses. Two or three courses will be discussed in depth. Guided by questions from the audience, we will give specific examples of assignments and assessment methods. Questions will be raised on the evaluation of students who complete the sequences.

Room: North Meeting Room

Presenters: Ros Welchman and David Stone, Brooklyn College
Title: *Nuts and Bolts of a "Standards-based Mathematics Course for Teachers"*
Abstract: The session will concern ways in which mathematics courses can be designed to develop prospective teachers' reasoning, mathematical communication, problem solving, and appreciation of connections of mathematics with other disciplines. We will present examples of particular activities related to these four themes, description of expected student performances, and ways to assess these performances. We will also present sample course outlines and supporting materials that document this work.

Does this sound familiar? It may, if you have submitted a teacher preparation program for NCATE review. The sharing of any experiences that others have had with the NCATE process will be appreciated.

Room: Demotte Room

Presenters: Fat Lam, Gallaudet University
Title: *Please Excuse My Dear Aunt Sally, she has been misunderstood for a long time.*
Abstract: Numbers and rules are beautiful. All mathematicians know this but few students ever appreciate it. As we look for ways to show connections, relationships, and even puzzles that naturally fit into place, math can become beautiful for even the most casual student of mathematics. The goal is to demonstrate that relationships in math are not purely accidental. Math is NOT a series of many unrelated rules and concepts. Rather, math grows in beauty as the simplest concept is explored and analyzed in greater depth.
At this presentation we will first give an overview of the math program at Gallaudet for preparing teachers for the deaf, then look at a well known acronym, PEMDAS, some real life classroom experiences will he shared. This will include the reactions of the students in a course for teachers, as one student adamantly defended her wrong answers and her Dear Aunt Sally.

Room: Conference Room

Presenters: Gina M. Foletta, Steve Wilkinson, and Maggie McGatha, Northern Kentucky University
Title: *Preparing Middle-Grades Mathematics Teachers*
Abstract: We will describe the Middle Grades Mathematics Certification program at NKU for teachers in Grades 5 - 9 that involves close collaboration between mathematics educators and mathematicians in the College of Education and the Department of Mathematics and Computer Science. Following guidelines from the MAA, the NCTM, and the Kentucky Core Content and Program of Studies, a minimum of 24 semester hours of mathematics, computer science and statistics content courses are designed to give middle grades teachers a "profound understanding of the fundamental mathematics" that underlies the middle grades curriculum. We will describe in depth two of the required courses especially designed for the middle-grades mathematics program: geometry and computer science.

Breakout Sessions: Friday 3:00 - 4:00

Room: Clark Lounge

Presenters: Kenneth C Millett, University of California, Santa Barbara
Title: *UCSB's South Coast Community Teaching Fellowship in Mathematics and Science*
Abstract: The University of California's Community Teaching Fellowship in Mathematics and Science engages four community colleges, a liberal arts college and UCSB in the recruitment and support of roughly 175 fellows during the academic year and summer programs. About 60% of the participants are from underrepresented groups. Roughly 80% pursue teaching careers after graduation from college, many in regional schools or in the "low performing" schools in which they were once students. The program goals are: (1) provide paid opportunities for successful mathematics and science students to explore secondary teaching careers, (2) to provide strong role models for secondary students, especially those from underrepresented groups, and encourage college preparation in mathematics and science and, (3) to promote professional collaborations among secondary teachers, college and university students and faculty members. Mathematics Fellows attend regular seminar courses, for which there receive credit, focused on building a foundation for teaching careers and on the exploration of mathematical topics that enrich their understanding of school mathematics. They work in secondary schools with mentor teachers, receive classroom visits to support their work and, produce a teaching portfolio, which they present at one of the two CTFMS symposia. All work is documented as part of their application to credential programs. The strategies employed to achieve these goals, to implement facets of the program and, some of the challenges encountered in the course of the project will be presented.

Room: Klingenstein Lounge

Presenters: Maria Terrell, Cornell University
Title: *Asking good question in the mathematics classroom.*
Abstract: For the past year I have been experimenting with ways to change how my students and I spend time in class. Research has shown what most experienced mathematics teachers know: students can do well in a course and still exhibit surprising deficiencies in the understanding of concepts. In an addition to creating a more active learning environment, I want to raise the visibility of the key concepts. The essence of the approach is “good questions”; questions that reflect the essential role of student prior knowledge and misconceptions in building a conceptual structure; questions that stimulate students’ interest and raise their curiosity; questions that help students monitor their understanding; questions that provide students frequent opportunities to make conjectures and argue about their validity; questions that provide me with frequent formative assessments of what my student are learning and that help guide me in how I spend time in class. What does it take to craft such questions? How are the students responding? I offer a report from the field.

Room: Demotte Room

Presenters: Jim Fulmer and Tom McMillan, University of Arkansas at Little Rock
Title: *Reforming the Mathematics Education Courses for Early Childhood and Middle Childhood Education Programs*
Abstract: Our case study will focus on three programs for future teachers: early childhood, middle childhood with mathematics/science specialty, and middle childhood with social studies/language arts specialty. We have two mathematics education courses for the early childhood program and three mathematics education courses for the middle childhood program. Each of these five mathematics education courses has a laboratory component. We have reformed our courses to integrate a laboratory component, mathematics content, and mathematics methods within the same course. Our goal is to emphasize group work in which our students are engaged as active participants, rather than passive observers. Our session will center on a description of these five courses and several examples of mathematics activities related to each course. What manipulatives are used? What about writing? What about oral communication? What about technology? What about problem solving? What about cooperative group work? Our session will focus on a discussion of these issues and how they relate to mathematics for teachers and mathematics for teaching.

Room: North Meeting Room

Presenters: Donald Marxen and Robert Keller, Loras College
Title: *New Directions: How One Small School Increased its Involvement in Mathematics Education*
Abstract: Challenged by national trends for reform and encouraged by committed educators, the mathematics department faculty at Loras College has become increasingly active in various facets of mathematics education. Over the past several years, members of the department have become involved with teacher in-service training, student mentoring programs, and initiatives aimed at improving the condition of mathematics education in the state. We have updated our pre-service program by revising traditional courses and adding an expanded seminar sequence to serve both future teachers and other mathematics majors.

In this breakout session, we will discuss the motivating factors that lead to these new directions, including relevant recommendations from several national professional groups. We will then discuss more specifically the various roles our faculty members play in mathematics education. Participants will hear concrete examples of ways in which they might become more involved in mathematics education on their own campus, in local school districts, and with their state's educational infrastructure.

Breakout Sessions: Saturday 1:30 - 2:30

Conversations with Teachers:

Room: Clark Lounge

Group I
Faith Muirhead, The Museum School, New York City
Julie Karlson, Charles O. Dickerson High School, Trumansburg, NY

Room: Klingenstein Lounge

Group II
Helen Gibson, Charles O. Dickerson High School, Trumansburg, NY
Terri Husted, Boynton Middle School, Ithaca

Room: North Meeting Room

Group III
Richard Cowan
Sally Vose, Newfield Middle School, Newfield, NY

Room: Demotte Room

Group IV
David Bock

Breakout Sessions: Saturday 3:00 – 4:00

Room: Emerson Suite B

Presenters: Alice F. Artzt: Mathematics Educator, Alan Sultan: Mathematician
Queens College of the City University of New York, Flushing, NY
Title: *Reforming the Preparation of Secondary Mathematics Teachers: An Innovative Four-Year Undergraduate Program.*
Abstract: The goal of the session is to describe an innovative four-year undergraduate secondary mathematics teacher preparation program, TIME 2000 (Teaching Improvement Through Mathematics Education), initially funded by the National Science Foundation in 1997. It has since become institutionalized. Innovative components of the program will be described: (1) Students are recruited directly from high school and block-scheduled into a coherent sequence of courses in mathematics and secondary education, taught by a select group of professors. (2) In contrast to traditional programs, TIME 2000 students begin their involvement in schools and their study of educational psychology in their lower freshman semester. They participate in lesson-study type activities during structured fieldwork supervised by a TIME 2000 professor. (3) In their upper junior year students take an innovative mathematics course, titled, High School Mathematics from an Advanced Standpoint, in which they work in small groups to teach the course. (4) Through the club, Today's Tutors, Tomorrow's Math Teachers (formed by TIME 2000 students), preservice teachers are given the opportunity to tutor middle and high school students. (5) In addition to the coursework, TIME 2000 students meet with

each other and the project staff on a regular basis for seminars, special projects, and events, for advisement, and to obtain feedback regarding the program. (6) Students submit annual portfolios that document their experiences and their knowledge and beliefs with regard to mathematics and mathematics teaching and learning.

The TIME 2000 Web site www.qc.edu/time2000 will be shown and course syllabi, student portfolios and student projects will be shared.

Room: Clark Lounge

Presenter: Marjorie Enneking, Portland State University
Title: *Portland State University Case Study*
Abstract: The PSU Department of Mathematics and Statistics offers multiple sections of mathematics for elementary teachers; a full program of special courses)offered as a math minor) for middle school (and upper elementary) teachers; a secondary teaching option for mathematics majors; and a mathematics-based Master of Science in Teaching Mathematics for secondary and community college teachers. This session will focus on how these programs and their courses differ; how they came about and gained approval; how they relate to other undergraduate and graduate mathematics programs and the graduate teacher licensing program; and what advising, scheduling, curriculum,text, and staffing issues are constantly considered and shepherded by a departmental committee. Examples from various courses will be used to illustrate how courses in the various programs differ. We will also (if there is interest) look briefly at the NCATE standards and the new draft "competencies" being developed by NCTM that our department (and all mathematics departments) may soon have to consider.

Room: North Meeting Room

Presenters: David Damcke and Gregory Hill, University of Portland
Title: *Math Excel Outreach : Getting College students into High School and Middle School math classrooms*
Abstract: In our Math Excel Outreach program, we involve college students working with high school and middle school students and teachers in mathematics classrooms. This program provides an opportunity for college students to work with experienced teachers in a workshop setting using cooperative learning groups. In the Math Excel model, the high school teacher and college student cooperate to develop lessons and questioning strategies that help high school (and middle school) students learn math. Our program is focused on large urban schools with high poverty rates and high percentages of minority students. The program started three years ago with six students at one high school and has expanded to 50 students working at two high schools and one middle school. This workshop is designed to provide practical information, tools and hands-on experiences that will help you to set up a Math Excel outreach program at your institution.

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Presenters: David W. Henderson
Title: *Teaching Geometry with Proofs Based on Experiential Meanings*
Abstract: I will demonstrate ways to teach a junior/senior level geometry course for mathematics majors and prospective teachers with a problems-based curriculum using writing, small group work, and experience-based meanings.

Room: Klingenstein Lounge

Presenter: Alan Tucker, SUNY Stonybrook
Title: *The CBMS Mathematical Education of Teacher report*
Abstract: This session will discuss both the general recommendations to the mathematics community about improving the mathematical education of teachers as well as the more specific guidance in the MET report about the content of mathematics courses for preparing future teachers at different grade levels.