

Mathematics Drives the Future
MichMATYC 2009 at Henry Ford Community College
October 9 and October 10, 2009

Summary of Presentations

Maria Andersen (Muskegon Community College)

How Can We Measure Teaching and Learning in Mathematics?

Did you know you can measure whether students have fragmented or cohesive conceptions of mathematics, or whether they learn at a surface- or deep-level? Did you know there are concept inventories available for research purposes at the level of prealgebra / elementary algebra and at the calculus level? Did you know there are inventories that will measure whether instructors are using student-centered approaches to teaching, or how instructors perceive their teaching environment? No? I didn't either. I'm thinking that if we put our heads together, Michigan community colleges can participate together to perform some truly outstanding research in the field of math education. Let me share what I've learned and we'll tackle it together.

Murney Bell (Anchor Bay High School and Siena Heights University – Metro Detroit)

Nspire: 2 Calculators in One

Let's explore features of the TI-Nspire handheld that create a dynamic dimension for students to visualize concepts and take an engaging, interactive role in their learning. Plus Keypad lets educators and students can continue using the TI-Nspire handheld alongside TI-83 Plus, TI-84 Plus and TI-84 Plus Silver Edition graphing calculator models.

Nspire in an Algebra Class

In Algebra classrooms, instructors need to explore the pedagogical implications of the document model as a tool for presentation, curriculum delivery, problem solving and recording students' thought processes. We'll discuss the implications of having students create and use their own documents, along with the value of exploration and investigation using pre-made documents.

Bill Briggs (University of Colorado – Denver)

Insights on Presenting and Teaching Calculus

Writing a calculus book inevitably leads to new perspectives on presenting and teaching calculus. In this talk, I will share some insights about what (I believe) should change and what should not change in teaching calculus. Specifically, I will describe a geometrical and intuitive approach that does not compromise rigor. The talk also focuses on the role of projects, graphics, and computer animations in teaching calculus.

Kathy Burgis (Lansing Community College): Facilitator

Department Chair Discussion

This session will offer math chairs the opportunity to compare and share their experiences. It is intended for current or former department chairs and deans, and also for those who want to find out more about what's involved in serving as a department chair.

Mark Chapman (Baker College)

Math "Boot Camps" with MyMathTest

The presentation will discuss how Baker College used MyMathTest (MMT) to manage a Math "Boot Camp" initiative aimed at bridging gaps in basic math skills. An example course used to conduct the camps will be reviewed and data from the initiative will be shared.

Gerry Cox (Lake Michigan College)

Euler: the Sine Function and the P-Series

Euler used the polynomial sine function and the harmonic series to find many reciprocal series. Some of these he would modify with the geometric series. A number of series will be shown and given in a handout. Several solutions to the famous "Basel Problem" will also be shown.

Jim Ham (Delta College)

Service-Learning in Introductory Statistics

This presentation will describe a service-learning project in an introductory statistics class in which students surveyed local residents on two contemporary topics: *school sports* and *the economy*. Students learned about survey research, and the local community benefited from the results of the survey.

Kathy Jankoviak Anderson (Schoolcraft College)

Math and Biology 2010: Are We There Yet?

Punnett squares and probability! Mathematical models that illustrate why size matters! Explore some connections between biology and mathematics suitable for entry level college mathematics courses.

Darlene E. Kohrman and Sheila Eisenhauer (Kalamazoo Valley Community College)

Developing the van Hiele Levels in a Pre-service Teacher Geometry Course

The NCTM's *Principles and Standards for School Mathematics* (2000) calls for geometric study where students will learn about geometric shapes and structures as well as analyze their characteristics and

relationships. The vision includes a curriculum where students learn to reason and see the axiomatic structure of mathematics. Therefore, there exists a great need for the development of deep conceptual geometric understanding in our future teachers. This presentation will demonstrate an attempt at developing a geometry content course that provides the opportunity for pre-service teachers to engage in activities that develop the van Hiele levels of understanding. Data will be presented showing pre and posttest results of growth in van Hiele understanding of our students.

Pat Kopf (Kellogg Community College)

Let's Model Data

The aim for this session is to demonstrate the use of graphing calculator technology to be used with modeling real world data. The session will include modeling both linear and exponential functions as would be appropriate for introductory and intermediate algebra students. The projects will help you to motivate, involve, and engage your students in innovative ways for a better understanding of real world mathematics.

Vilma Mesa's Research Group

Implications of Two Research Studies

In this presentation we will talk about findings of two research studies of instruction , one that looked at textbooks used for three math courses, college algebra, trigonometry, and pre-calculus, and one that looked at patterns of interaction between instructors and students in these classes. We offer some implications for practice from these findings.

Jill M. Mueller (Muskegon Community College and Baker College of Muskegon)

Using Technology to Enhance an Introductory Statistics Course

The more opportunities that our students have to analyze the use of statistics in real-world settings, the deeper their understanding will be of the fundamental concepts that underpin any introductory statistics course. The challenge for instructors is to have a personal, "living" resource base where we can store and organize websites, online news articles, videos, etc. and have them at our fingertips when we need them. In this presentation, I will demonstrate how to find relevant resources to use in an introductory statistics course and organize them using a free online mind-mapping software called "Mindomo."

Jack Rotman (Lansing Community College; Chair, AMATYC Developmental Mathematics Committee; Leader, AMATYC "New Life for Developmental Mathematics" Project)

Where is Developmental Mathematics GOING??

Much is happening at the national level to provide a different direction. AMATYC has a project (“New Life for Developmental Mathematics”) to develop a new vision, and other major groups are also active. This session will present a summary of the key ideas being used in these activities: What do they mean for you?

Nancy J. Sattler, Ph.D. (Terra Community College)

Natives versus Aliens

The presenter will offer strategies (e.g. the one-minute lecture, interactive collaboration/discussion, cooperative learning, and use of YouTube) to enable digital aliens to create a learning environment for digital natives that will engage students in their own learning. Participants will be asked to share effective strategies they have used in their classroom.

Michael Sullivan (Joliet Junior College)

Technology and a New Teaching Paradigm

The teaching community has been inundated with a variety of technology tools that enhance instruction. We will focus on how we can marry technology such as Camtasia, clickers, and online homework systems with more traditional instructional tools such as worksheets that promote an active learning environment in which students develop communication skills.

Roger Verhey (UM Dearborn)

Learning about Lesson Study: Faculty collaborating to impact student learning?

Teacher professional practice is the energy that drives Lesson Study as an opportunity to investigate teaching practices that impact student understanding. It is a collaborative process that connects a team of teachers to a shared understanding of content and student learning with the goal of improving student learning. Teachers work in teams, carefully and collaboratively crafting their “research” lesson. Their lesson is then taught to one of their classes with team members observing students as they respond to the lesson; thereby, gaining deeper insight into student thinking. Since publication of the TIMSS (Third International Mathematics and Science Study) reports, lesson study has received considerable attention in the U.S. and has been highlighted by the National Council of Teachers of Mathematics for its promise in helping teachers develop effective pedagogy for student-centered instruction.