MTC Workshops

HANDS-ON APPROACH ATTRACTS TEACHERS

Hands-on workshops continue to be an effective means of disseminating MTC courses. In this article we list and briefly discuss MTC workshops held during the past year.

- On June 15-27, 2003, IU Bloomington hosted the Indiana University-Indiana Mathematics Initiative Partnership’s Summer Institute on Mathematical Modeling for Secondary School Teachers. This was a workshop for 26 secondary school mathematics teachers from urban school districts across Indiana. The institute is a partnership between the Indiana Mathematics Initiative and IU, funded by the NSF Mathematics/Science Partnership program.

  The workshop was organized and directed by Daniel Maki, Maynard Thompson, and Paul Kehle, all MTC course developers. On June 20, Marc Frantz acquainted the workshop participants with his MTC Mathematics and Art course by leading them through a series of experiments and exercises in the mathematics of perspective. In other sessions, Kehle, Maki, and Thompson discussed mathematical modeling, probability theory, and forecasting methods.

- One of MTC’s most successful series of dissemination workshops has been the VIEWPOINTS Mathematics and Art workshops for teachers, held during the summers at Franklin & Marshall College, with a follow-up workshop in the fall at IU Bloomington. The VIEWPOINTS facilitators are Marc Frantz of IU Bloomington and Annalisa Crannell of Franklin & Marshall College. In 2001, The Mathematical Association of America's Professional Enhancement Program (PREP) added its support to VIEWPOINTS, sponsoring both the summer and fall workshops. On January 16, 2003, PREP sponsored a reunion/special session for VIEWPOINTS 2001 participants at the AMS/MAA Joint Mathematics Meetings in Baltimore. Participants gave presentations on their interdisciplinary use of VIEWPOINTS ideas and materials in their undergraduate classes.

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FROM THE DIRECTORS

A Place to Tell Our Story

TEACHING AND LEARNING BOOK FEATURES MTC

During the course of the MTC project, our administrators, evaluators, and course developers have taken numerous opportunities to publicize specific aspects of MTC. Through workshops, presentations, publications, etc., participants have reached out to educators and students across the country.

Until recently, however, there has not been the chance to present the whole story in one place. That will change in February, 2004, when Indiana University Press publishes the book, The Scholarship of Teaching and Learning: Contributions of Research Universities, edited by William E. Becker and Moya L. Andrews of Indiana University.

The book will contain a lengthy chapter on the MTC project.

Becker, a professor of economics, and Andrews, a professor of speech and hearing sciences, set three main goals for their book. They wanted to show how: 1) the discipline-based research of faculty members influences their teaching, leading to more meaningful student activities, 2) advancements in the assessment of student outcomes are promoted by research, and 3) the research university’s size and diversity enhance the dissemination of ideas about teaching and learning across disciplines.

In the editors’ words, “This book is itself a testament to the dissemination role of research universities, and is the result of a three-year program at Indiana University in which research faculty members work in seminars and colloquia on the scholarship of teaching. The primary authors in this book were selected from the scholars who made presentations in this program between 1999 and 2002.”

MTC Principal Investigators Dan Maki and Bart Ng, and Assistant Director Marc Frantz contributed a chapter titled “The Indiana University Mathematics Throughout the Curriculum Project.” The work has recently been accepted after peer review and will appear as Chapter 12 in Scholarship.

The chapter includes discussions of MTC courses in business, history, physics, speech and hearing sciences, biology, journalism, finance, and art. Dissemination is discussed as well, including some of the MTC teacher workshops.

The chapter also details the work of the project evaluators, Diana Lambdin, Rajee Amarasinghe, and Dasha Kinelovsky. The evaluators, headed by Lambdin, made substantial contributions to dissemination in the form of papers and presentations to specialists in education. Amarasinghe wrote his PhD thesis on the evaluation work he did for the project.

Maki, Ng, and Frantz feel they have been able to meet each of the editors’ three goals, thanks to the excellent work of MTC participants. At the same time they have found a good place to describe the history and current state of the project.

Having seen the abstracts of the other contributors, the three authors expect Scholarship to be a valuable book, and an excellent place to tell the story of MTC.
Aided by a supplemental grant from NSF to support participants, VIEWPOINTS 2003 (Franklin & Marshall College, June 8-13) was the largest VIEWPOINTS workshop to date, with 24 participants from across the country. Participants used Marc Frantz’s Lessons in Mathematics and Art, along with substantial supplements from co-leader Annalisa Crannell’s courses at Franklin & Marshall. Activities included studio work, computer lab work, and a mathematical tour of Franklin & Marshall’s Phillips Art Museum. As usual, participants will be invited to a reunion workshop at IU Bloomington in November to present their use of VIEWPOINTS ideas and materials in their classrooms. The VIEWPOINTS website is at mypage.iu.edu/~mathart/viewpoints/.

Another successful series of MTC workshops is Physics-Based Calculus, which ran for the third consecutive year on June 16-18, 2003, at Indiana University - Purdue University Fort Wayne (IPFW). The workshops are based on IPFW professor Peter Hammer’s MTC course, “Catch the Waves to Calculus.” Hammer’s students learn calculus via Fourier analysis and research projects mentored by professors from other disciplines. The workshops in-hands-on work in a physics lab with experimental and data-gathering equipment. Pictures from the workshop can be seen on the workshop website at www.ipfw.edu/math/workshop/PBC.html.

Paul Kochanowski and Morteza Shafii-Mousavi used their MTC course, “Mathematics for Social and Industrial Problems,” as the focus of a workshop session called “Inquiry-Based Learning in a Mathematics Course,” given at the workshop, Reflective Seminar on Inquiry-Based Education, on October 1, 2002, at Indiana University Purdue University Indianapolis workshop was co-sponsored by the Association of American Colleges and Universities and the IUPUI University Library Office for Professional Development.

During the past year, MTC course developers engaged in a substantial amount of dissemination. In this article, we list dissemination in the form of presentations and publications, including works in progress.

**BOOKS/CDs**


- PIs Dan Maki and Bart Ng, and Assistant Director Marc Frantz, have written a chapter on MTC for the book, *The Scholarship of Teaching and Learning in Post-Secondary Education: The Contributions of Research Universities*. The chapter, titled “The Indiana University Mathematics Throughout the Curriculum Project,” has been accepted for inclusion after peer review. *Scholarship* is edited by William E. Becker and Moya L. Andrews of Indiana University. (For details see “A Place to Tell Our Story” on Page 2.)

- Charles Livingston and Paul Voakes, developers of the MTC course “Mathematics and Statistics for Journalism,” have continued to work on their book, *Working with Numbers: Statistics and Mathematics for Journalism*. This is a handbook for journalists and students of journalism on the use and presentation of mathematics and statistics in journalism writing. The course uses draft copies of the book.

- The prototype course for MTC is PI Dan Maki’s course for the IU Liberal Arts Management Program. In this course, students do actual consulting for businesses, learning the required math skills along the way.

  MTC course developers Morteza Shafii-Mousavi and Paul Kochanowski of IU South Bend, and Chris Lang of IU Southeast also teach such courses. The four developers are writing a workbook, complete with case studies, extensive data sets, and a teacher’s manual. To date, ten case studies have been completed.

**PAPERS/ARTICLES**


- Kochanowski and Shafii-Mousavi presented the paper “Mathematical Preparation for First Year Statistics Courses” at the American Statistics Association Conference, San Francisco, California, August 6, 2003. The paper, which highlights their MTC course “Mathematics for Social and Industrial Problems,” will be published in the conference proceedings.

- Annalisa Crannell of Franklin & Marshall College frequently uses techniques from her Mathematics and Art class in higher level courses. Along with former Franklin & Marshall student Brian Habecker, ’02, she has described some of these activities in the article, “Using Fractals to Motivate Linear Algebra,” submitted to *Undergraduate Mathematics and its Applications*.

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Because of her involvement with Mathematics & Art and VIEWPOINTS, Crannell was featured in a special issue of the AMS Member Newsletter (Winter 2003, page 1). The article also gave a plug for the VIEWPOINTS Mathematics and Art workshops. (The article is available online at http://www.ams.org/membership/membnewsltr-winter2003.pdf.)


INTERNET DISSEMINATION

Marc Frantz of IU Bloomington continues development of his online Mathematics and Art text, Lessons in Mathematics and Art (php.indiana.edu/~mathart/viewpoints/lessons/). In February 2003, the online journal, MathForum@Drexel Internet News, honored Lessons by featuring it in the Volume 8, No. 6 issue (mathforum.org/electronic.newsletter/mf.intnews8.6.html).

April, 2003 was Mathematics Awareness Month (MAM), and the theme was Mathematics and Art. Marc Frantz and Annalisa Crannell took the opportunity to disseminate information about their MTC Mathematics and Art courses, as well as and Art workshops for teachers. The official MAM web site featured essays by Crannell (“Math and Baseball Art”) and Frantz (“Drawing with Awareness”). The site also listed the two as available speakers; see http://mathforum.org/mam/03/, and “Presentations” below.

PRESENTATIONS

As a Mathematics Awareness speaker, Crannell gave the talk, “Crayons and Computers: Awesome Pictures of Math,” on the following occasions:

• The Allegheny Mountain section meeting of the MAA, Penn State DuBois (April 4, 2003)
• Marguerite Lehr Lecturer (keynote speaker) at Bryn Mawr College’s Math Awareness Week (April 7, 2003)
• Role Model at the Annual Glenna Hazeltine Women in Mathematics and Science Conference, Millersville University (April 8, 2003)
• Sonia Kovalevsky Day, St. Joseph's University, New York, NY (May 15, 2003)
• GEMS program at Delaware State University (July 7, 2003).

Frantz gave the talk, “What I Wish I Had Known in Art School,” for:

• Mathematics Awareness Month, University of Delaware, April 11, 2003
• Mathematics Awareness Month, Bellarmine University, Louisville, KY, April 25, 2003.

Frantz’s host at Bellarmine University, Professor Daylene Zielinski, later attended the VIEWPOINTS Mathematics and Art workshop and now plans to teach a Mathematics and Art course at Bellarmine.

MTC Assistant Director Marc Frantz attended the 28th Annual Conference of the American Mathematical Association of Two-Year Colleges (AMATYC), held on November 14-17, 2002 in Phoenix, Arizona. At the session titled Explore the Future of Math Education: A Poster Session of NSF Projects, Frantz gave a presentation on MTC and distributed workshop brochures and project newsletters to educators.

Once again the MTC booth at the AMS/MAA Joint Mathematics Meetings (Baltimore, January 15-18, 2003) attracted considerable attention from educators, who were especially interested in workshop brochures and project newsletters.

In addition, key project personnel gave presentations on their interdisciplinary work at the Meetings. Paul Kochanowski and Morteza Shafii-Mousavi gave two presentations. The first was “A Demonstration of the Use of the Traveling Salesperson Problem in Finite Mathematics,” on January 16. The second was “Using Projects to Link Mathematics, Statistics, Business, Economics & Other Disciplines in a First-year Course,” on January 18.

Marc Frantz and Annalisa Crannell hosted a reunion of VIEWPOINTS Mathematics and Art workshop participants at the Joint Meetings. For more information see “Workshops” on Page 1.
LOOK FOR SUMMER WORKSHOPS

The next issue of this newsletter will present information on MTC teacher workshops for summer 2004. Workshops will include Honors Calculus/Physics.

AMS/MAA JOINT MATHEMATICS MEETINGS

Once again, MTC will have a dissemination booth in the exhibition room of the annual Joint Mathematics Meetings of the AMS/MAA. The Meetings will take place on January 7-10, 2004, in the Phoenix Civic Plaza.

VIEWPOINTS REUNION

Annalisa Crannell and Marc Frantz will host a reunion for participants in their VIEWPOINTS 2003 Mathematics & Art workshop. The reunion will take place on Saturday, November 15, 2003, at Indiana University Bloomington. Participants will

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