

***Conversations Among Colleagues:
Collaborating to Improve the Mathematics Education of Our Students***

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The Project: *Conversations Among Colleagues: Collaborating to Improve the Mathematics Education of Our Students*

Conversations Among Colleagues annually convenes mathematicians, mathematics educators, mathematics curriculum consultants, and K–12 mathematics teachers from across Michigan to focus on how best to prepare K-12 teachers to teach mathematics. The conference provides participants with the opportunity to learn about state and national recommendations, to consider implementation approaches that have merit, and to work as teams on plans to implement change in their home institutions.

Rationale

The issue of preparing teachers of mathematics has long been an important focus for professional organizations across the state and nation. Presentations focusing on the topic consistently are offered at conferences held by national associations including the Association of Mathematics Teacher Educators (AMTE), the National Council of Teachers of Mathematics (NCTM), and the Mathematical Association of America (MAA). Locally, such sessions are frequently offered at conferences sponsored by the Michigan Council of Teacher of Mathematics (MCTM), the Michigan section of the MAA (MAA-MI), and the Michigan Mathematical Association of Two Year Colleges (MichMATYC). What had been missing were opportunities to communicate and collaborate across professional organizations. Such opportunities can positively impact the efforts of all parties by bringing together the multiple perspectives and expertise of those who work in different ways on this same issue.

Interest in finding a way to increase communication is further motivated by increasing pressure on colleges and universities to change the preparation of teachers of mathematics. Nationally, demands come from *No Child Left Behind* legislation as well as from recommendations by the National Council of Teachers of Mathematics and the Mathematical Association of America. At the state level, new programs for state certification as well as the creation of the Michigan Curriculum Framework have provided stricter guidelines about what prospective teachers are required to know and be able to do. In addition, *The Mathematical Education of Teachers* (2001) a document produced by the Conference Board of the Mathematical Sciences, strongly recommends that colleges and universities offer mathematics courses specifically designed for K-12 teachers; courses that are different from those offered for other clients such as engineers or nurses.

For mathematics departments across the country, trying to implement these recommendations proves challenging. In Michigan, most teacher certification universities and colleges do not have sufficient numbers of students to make it feasible to offer (much less to invest in creating) special sections of mathematics courses specifically designed for future teachers. In addition, university and college mathematicians who teach the core courses for majors and minors, many of whom plan to be teachers, are generally unaware of the requirements of the *No Child Left Behind* legislation, state teacher certification, and the Michigan Curriculum Framework.

Faced with these challenges, the idea emerged for an annual conference that would bring mathematicians and mathematics educators together to discuss, plan, and implement

recommended changes. A PMET proposal was created identifying the following objectives for a regional conference:

- To provide mathematicians, mathematics educators, mathematics curriculum consultants, and K–12 mathematics teachers the opportunity to converse about and plan for addressing the problem of preparing prospective teachers to teach mathematics at the K–12 level;
- To provide mathematicians, mathematics educators, mathematics curriculum consultants, and K–12 mathematics teachers the opportunity to learn from national leaders about the ways that people learn and understand mathematics and how this plays out in their work with college students;
- To offer participants the opportunity to learn from state leaders about certification issues in Michigan, including Michigan’s definition of highly qualified teachers of mathematics required by the No Child Left Behind legislation, the Michigan Curriculum Framework for Mathematics (the content that teachers need to teach), and the Michigan Program Review/Periodic Evaluation for Teacher Certification for Mathematics majors and minors;
- To offer participants the opportunity to learn about the level of mathematical understanding newer K–12 mathematics curricula require of students; and
- To offer participants the opportunity to learn of solutions being carried out at various universities and colleges in the state and country.

Collaboration through Conversations

The first *Conversations Among Colleagues: Collaborating to Improve the Mathematics Education of Our Students* was held at Grand Valley State University in March of 2004. The success of the first year provided the impetus for institutions to volunteer to host future *Conversations Among Colleagues* conferences. With an eye to rotating the conference geographically, it was hosted at Michigan State University in 2005 and at the University of Michigan in 2006. Future *Conversations* are planned for Central Michigan University (2007) and Western Michigan University (2008).

Beginning that first year, registrants have been encouraged to attend with colleagues from their home institutions in order to increase the potential for ongoing discussions and planning for implementation. Each year’s conference is designed to provide opportunities to interact with panels of national and state experts on the mathematical preparation of teachers, to learn about how to prepare teachers while also accommodating the needs of other clients, and to consider how to apply some of the new ideas to their own courses and programs. Speakers have included Deborah Ball, Hyman Bass, Glenda Lappan, Alan Tucker, Henry Kepner, Michael Battista, Joan Ferrini-Mundy, Alan Sultan and Alice Artzt, Martha Aliaga, Suzanna Epp, Kathleen Heid, Sharon Senk and Richard Hill, Gail Burrill, Patricio Herbst and Dan Chazan.

In addition to providing opportunities for colleagues in the region to learn from nationally known speakers, the hosting university each year invests time and effort in highlighting their own research and implementation activities, which encourages involvement by a broader range of presenters each year. For example, during the 2004 conference, six teams of GVSU mathematics, statistics, and mathematics education faculty members presented their work on

Enhancing the Mathematical Core. This project, ongoing since 2001, has resulted in the enhancement of six of the core courses for all mathematics majors and minors: Communicating in Mathematics (the first proof course), Linear Algebra, Modern Algebra, Probability and Statistics, Euclidean Geometry, and Discrete Mathematics. In 2005, Michigan State University faculty members presented their research on assessing knowledge for teaching algebra, fundamental concepts in algebra, and what they have learned through their “Teachers for a New Era” project. As the host in 2006, the University of Michigan in Ann Arbor drew upon the expertise of colleagues in the School of Education, the Mathematics Department, the Statistics Department and the Department of Engineering.

In several cases, these *Conversations* presentations have provided the impetus to form networks of colleagues with similar interests as local researchers, curriculum developers, and professional development experts make their own work more explicit. Teams from different departments and institutions work together on projects and presentations and, in doing so, learn about and from each other’s work. In addition, *Conversations* sessions have brought together panels from diverse backgrounds. For example, in 2005, a session focusing on continuing professional development of mathematics teachers brought together a panel that included faculty from a research university, a teaching university, a small college, and two members of the state department of education, with each panel member informing the others as well as participants in the session.

The planning of the annual conferences is also a collaborative effort. Each year, the conference is planned with guidance from members of several professional groups in Michigan: the Michigan Mathematics Teacher Educators (MMTE), the Michigan Council of Teachers of Mathematics (MCTM), the Michigan Section of the Mathematical Association of America (MAA-MI), the Michigan Mathematical Association of Two-Year Colleges (MichMATYC), the Center for K-12 Mathematics Teaching at Western Michigan University, the Center for Proficiency in Teaching Mathematics (CPTM) at the University of Michigan, the Center for Mathematics Education at the University of Michigan-Dearborn, and the Division of Science and Mathematics Education at Michigan State University. Also, faculty members from several colleges, universities, and community colleges have participated in the planning of one of more of the *Conversations*: Grand Valley State University, Michigan State University, University of Michigan, U of M – Dearborn, Ferris State University, Aquinas College, Washtenaw Community College, Montcalm Community College, and others. These committees have articulated unifying questions for the conferences: How do people learn and understand mathematics? How does this play out in our work with college students, especially those who plan to teach mathematics?

Working together, committee members nominate and invite speakers, determine the format of the conference, make site arrangements, and publicize the conference via web sites, electronic communication, flyers, and mailed conference materials. The committee also raises funds and in-kind support from professional organizations, universities, and mathematics education centers in order to keep the conference registration fee affordable. In addition to the institutions mentioned above, funding from PMET was a major catalyst that enabled this conference to get off the ground in the first year and to have continued success as it established itself.

The conferences have been increasingly well attended each year. By 2006, in addition to over one hundred participants from Michigan, participants came from Ohio, Illinois, Indiana,

Wisconsin, and Canada. The organizers for *Conversations Among Colleagues* have also organized pre-conference and conference strands that take place during the annual Michigan Council of Teachers of Mathematics (MCTM), the University of Michigan Mathematics Education Leadership, and the Michigan Section of the Mathematical Association of America (MAA-MI) conferences and meetings. These forums provide a way to extend the discussion throughout the year and to encourage new people to join the conversation.

The *Conversations Among Colleagues: Collaborating to Improve the Mathematics Education of Our Students* conferences continue to provide a forum where mathematicians, mathematics educators, mathematics consultants, and K–12 mathematics teachers can share concerns, expertise, and suggestions for continual improvement of the mathematics education of teachers with the goal of improving the mathematics education of all students. The organizers welcome comments, suggestions, and volunteers for future presentations.

References

Conference Board of the Mathematical Sciences. (2001). *The Mathematical Education of Teachers*. Providence, RI and Washington DC: American Mathematical Society and Mathematical Association of America. [http://www.cbmsweb.org/MET_Document/index.htm]