

**American Mathematical Society
Committee on Education Meeting
October 16-18, 2014
Washington DC**

Summary

The focus of the meeting was on the first two years of post-secondary mathematics education, including the interaction with other disciplines. Presentations included talks about the highly successful Michigan calculus program, the recent changes at Illinois to better serve engineering students, and an update on the American Statistical Association's work on curriculum guidelines for the first two years of statistics education. Information was also presented on the progress of Transforming Post-Secondary Education in Mathematics (TPSE Math) and on the common vision for undergraduate mathematics.

Helping Students Do Mathematics

Matthew Ando (University of Illinois at Urbana-Champaign) began his presentation by providing some scale and information on the nature of the University of Illinois' efforts to increase the number of students studying mathematics. He described their projects involving engineering calculus, using active learning strategies in large scale calculus courses and their merit-based programs, including Merit Immersion for Students and Teachers (MIST). He also provided information on their other efforts including the Illinois BioMath project and the Illinois Geometry Lab. Some new initiatives at the university, as well as information on placement and their graduate program were also discussed.

It Takes a Math Department

Stephen DeBacker (University of Michigan) discussed the contributions that many people make to the success of the undergraduate program at the University of Michigan emphasizing the importance of department buy-in and participation ... it takes a department. His presentation focused on a small part of a large undergraduate program, including providing information on the mathematics placement process and descriptions of the courses offered. He also discussed the training provided for new graduate student and postdoc instructors.

Updated ASA Guidelines for Undergraduate Programs in Statistics

Nicholas Horton (Amherst College) provided a draft copy of the new American Statistical Association Guidelines for Undergraduate Programs in Statistical Science to meeting attendees and discussed the key changes being proposed.

The ASA last endorsed curricular guidelines in 2000 and have formed a new working group to update them. The new guidelines reflect the increased importance of data related skills in modern practice and provides suggestions for the development of curricula for undergraduate programs in statistical science, both for statistics majors and other majors seeking a minor or concentration. These recommendations provide more emphasis on teamwork, communications and related experiences (e.g. internships, REUs and capstones).

The working group has organized a series of webinars to focus on different issues related to the new guidelines. Horton reached out to those attending to encourage participation and feedback. The new guidelines will be brought forward for endorsement by the ASA Board of Directors in November 2014.

Report on Transforming Postsecondary Education in Mathematics (TPSE Math) Meeting in Austin

Mark Green (University of California, Los Angeles) provided some background information on TPSE Math, sponsored jointly by Carnegie Corporation of New York and the Alfred P. Sloan Foundation, which seeks to effect constructive change in postsecondary mathematics education.

Green presented information on the TPSE Math meeting at the University of Texas-Austin in June 2014. The focus of the meeting covered a number of topics, which included discussions on: 1) diversifying teaching methods; 2) broadening the curriculum; 3) moving towards a teaching “community;” 4) providing more pathways and fewer barriers; 5) balancing costs and programs; 6) improving listening and communications strategies; 7) serving all potential students, including those from other disciplines and at all levels; 8) broadening the training of graduate students; 9) fostering community-wide change; and 10) pulling together all stakeholders to address changes needed.

Grant Project Report: A Common Vision for Undergraduate Mathematics in 2025

Karen Saxe (Macalester College) reported on the Common Vision 2025 project, a collective effort to examine and modernize undergraduate mathematics education in order to better prepare students for the demands of a 21st century workplace. The project is funded by the National Science Foundation (EHR/DUE) and organized by the MAA, with representation by the AMS, SIAM, ASA and AMATYC. The project is tasked with identifying common themes among the undergraduate mathematics curricula recommendations promulgated by these five professional organizations in order to frame a shared vision for the future of undergraduate mathematics education. Phase I of the project includes a May 2015 workshop.

Structured Active In-Class Learning at Penn: Opportunities and Challenges

Dennis DeTurck (University of Pennsylvania) discussed the University of Pennsylvania’s involvement in the Association of American Universities (AAU) Undergraduate STEM Education Initiative. This initiative includes eight project sites, but the University of Pennsylvania (Penn) is the only one with a significant math component.

The AAU initiative is a five-year project to improve the quality of undergraduate teaching and learning in science, technology, engineering and mathematics (STEM) fields. The initiative at Penn is done through a program called “SAIL” – Structured, Active, In-class Learning. SAIL classes emphasize the active engagement of students through structured work guided by the instructor.

DeTurck described the SAIL program at Penn highlighting how the program has grown as more faculty transform existing courses, replacing lectures with active learning -- and the difficulty in creating enough collaborative classroom space as the program grows. He also discussed measuring SAIL success, faculty support and the growth of SAIL beyond STEM at Penn.

Budapest Semesters in Mathematics Education: Study abroad program for pre-service teachers

Ryota Matsuura (St. Olaf College) began his presentation with a brief history of the Budapest Semesters in Mathematics (BSM) program. The BSM program provides undergraduates with an opportunity to experience mathematics amidst the culture of Hungary, which has a long tradition of excellence in mathematics education.

Matsuura then discussed the Budapest Semesters in Mathematics Education (BSME). This program differs from BSM in that its goal is to study the Hungarian approach to the learning and *teaching* of mathematics. In this semester-long program, participants play dual roles as students and as teachers in the Hungarian approach to learning mathematics.

The first BSME courses will be offered in 2015-16. Matsuura described the BSME approach and talked about participant profiles, instructors, courses and costs.

Teaching Effective Thinking through Mathematics

Michael Starbird (University of Texas) challenged meeting attendees to think of undergraduate college mathematics courses as something different than what is currently offered to students who do not go on to study mathematics further. He pointed out that many people in the world do not use math above the high school level, and for these students, there is an opportunity to provide courses rich in the thinking skills that mathematics provides instead of the terminal courses that will leave them bored with a stultifying experience. Much discussion followed his presentation.

Post-secondary mathematics education in Quebec: a view of the CEGEP educational level

Bernard Hodgson (Université Laval) discussed the structure of the educational system in Quebec and shared data on the success of the CEGEP model. The CEGEP (a French acronym) resulted from a study of Quebec's educational system in the 1960s resulting in the *Parent Report*. This report identified many weaknesses in the educational system and highlighted differences in academic success among students of different backgrounds. The CEGEP, among other initiatives, was created to address these problems.

The CEGEP, adopted in 1967, is a network of 48 regional institutions providing pre-university programs (2 years) and vocational programs (3 years) at no cost to the student -- and is compulsory for all students. The educational model in Quebec requires students to attend primary school (K + 6 years), secondary school (5 years) and CEGEP (2/3 years).

General Discussion

The meeting was organized purposefully to allow discussion on topics of general concern and interest. These discussions resulted in conversations about innovations in teaching and student learning methods, funding, other departmental issues, as well as collaborating with other disciplines.

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