

Southeast Regional Meeting on Upper-Division Pathways: How Can TPSE Help?

TPSE's Southeast Regional Meeting on Upper-Division Math Pathways, co-organized with Morehouse College and the National Association of Mathematicians (NAM) and held at Morehouse on June 10-11, 2019, gave participants an opportunity to discuss and strategize about approaches to enhancing mathematical learning in response to regional workforce needs or as preparation for graduate school. Participants were encouraged to explore multiple aspects of upper-division pathways, including updating curricula and programs, forming partnerships and fostering collaboration, and improving communication.

In the course of the meeting's presentations and panel discussions, breakout sessions, and large group interaction, several themes central to the vision and mission of TPSE emerged. Participant suggestions for how TPSE can help in these areas - transformation, communication, mentorship, and workforce connections - are included in each section below.

Transformation: No matter how good we think we've been, we must think we can be better for this time – and for the future. –David Thomas, President, Morehouse College

A theme central to the heart of TPSE's mission was similarly a central theme at the Morehouse convening – transformational change. Chuang Peng from Morehouse College stated that, in addition to curricular or pedagogical changes, there exists a "need to transform ourselves ... if we [mathematical practitioners and stakeholders] don't change, we won't survive."

How can TPSE help?

Create a platform to promote and advertise institutional innovations and highlight programs that seek to transform upper-division math pathways to better fit the needs of evolving careers and research. Provide examples of pathways that are successful in transforming curricula at various institutions.
Communication: As my grandmother once told me, you can be really good at numbers, but it doesn't matter if you can't communicate what you have learned. –Darius McDaniel, CDC and Emory University

A continuous theme throughout the meeting was improving communication. There were several panelists who commented that "it's not just about math" – writing skills are just as important as mathematical skills at the undergraduate level and beyond. Rachel Levy of the Mathematical Association of America spoke of even the best math students being unable to adequately explain their knowledge, skills, or "tools," or know when to "pull them out and use them." Darius McDaniel stressed the importance of writing and speech in relation to communicating mathematical skills and applying them to workforce needs, observing "it takes more" than math to be successful post-college.

How can TPSE help?

Create a repository or clearinghouse of case studies on what works, in addition to advice from alumni across the country.

Better utilize the TPSE website for resource sharing – for example, links to datasets and best practices. Post survey questions and results so they are easily accessible to meeting participants.

Make TPSE Math more visible at JMM.

Mentorship: It takes someone to care, to take the extra time, to never give up and provide guidance and mentorship. –Travell Williams, Analytics Specialist, Delta Airlines and Morehouse graduate

Several meeting participants, particularly former students, highlighted the need for engagement, guidance, and mentorship from faculty, advisors, and administrators. Several students on the Alumni Panel – which was comprised of Morehouse and Spelman College graduates – related the challenges they faced in completing their undergraduate degrees, including in one case failing courses multiple times and even getting kicked out of school for a year. If not for the support and encouragement offered by Morehouse staff and faculty, most of these students would have been unable to persist and ultimately succeed in transitioning to graduate school or careers in business, industry, or government.

How can TPSE help?

Develop a rewards system that recognizes innovation at the faculty and institutional level.

Workforce Connections: We have lots of information and data – more than ever before. What we need is students and workers with the [mathematical] skills to make sense of it all in the "real world." – Suzanne Weekes, Worcester Polytechnic Institute

A central purpose of the meeting was to examine workforce connections and their alignment with the mathematical skills and knowledge learned at the upper-division level. Much of the conversation revolved around data and computer science and their implications for the study of mathematics. As Suzanne Weekes pointed out, "We have a data science tsunami that is not going away." William Cousins, a Senior Data Scientist with the Tampa Bay Rays, agreed with the need to apply mathematical reasoning to real-world issues and scenarios. "Data is constantly shifting," he noted. Despite the growing popularity of computer science programs, alumni panelist and University of Georgia Ph.D graduate Zerotti Woods still felt there was a strong need for more mathematicians in the fields of data and computer science. In his view, connecting the agendas and outcomes of computer science and mathematics is essential for success in both fields. Participants and panelists also stressed the need to collect more data that illustrates the "high employability" of math majors.

How can TPSE help?

Invite industry to TPSE events to promote networking and knowledge sharing.

Use TPSE's networks to create an alliance between institutions in a region or state and have TPSE