



July 20, 2018

Dear Members of the Council on Teaching:

In November 2017, I was awarded a Teaching in Higher Education Travel Award. I used the award to attend the Conference on Research in Undergraduate Math Education in February 2018. Research in Undergraduate Math Education (RUME) is a Special Interest Group of the Mathematical Association of America (SIGMAA). I have been part of the SIGMAA RUME through my membership in the MAA, but by participation in the group had been limited mostly to reading emails and articles posted to the group's listserv. I learned about the conference a few years ago, and the February conference was the first I attended.

The three-day Conference on RUME included optional working groups in addition the typical line up of plenary talks, research presentations, and poster sessions. The working groups provided an opportunity for attendees to discuss different areas of research and collaborate on projects. Because of my role as the director of the Math Tutorial Lab, I attended the working group for Math Resource Centers in order to network with directors of similar centers. Below, I highlight several ways in which my participation at the Conference on RUME has benefitted my professional development and how I hope it will improve the Department of Mathematics and the broader University of Iowa community. Since the working group on Math Resource Centers was so valuable, work extending from that experience is a separate section.

Professional Development and Impact of Math Resource Center Working Group

The Math Resource Center working group turned out to be the most valuable part of the conference for me. In addition to meeting many people from a variety of institutions with similar roles, I learned about an NSF sponsored workshop in May 2018 at Oklahoma State University. I applied and was accepted to attend this workshop. Many of the same people who were at the working group at the Conference on RUME were also at the Oklahoma State workshop, and I enjoyed getting to know many people better. Since the RUME conference and the Oklahoma State workshop, I am working on the following projects/improvements to the Math Tutorial Lab.

- **Improving and expanding the training of the undergraduate tutors in the Math Tutorial Lab.** Undergraduate tutors working in the Math Lab participate in the Tutor Certification Program sponsored by the Office of Academic Success. I am planning to require additional training for undergraduate tutors this fall that will focus on issues specific to tutoring mathematics. I received many ideas and materials used in other centers at each of the meetings I attended which will be very useful for designing training sessions.
- **Participating in a weekly reading group to discuss literature related to mathematics tutoring.** Many of the other directors have a background in mathematics education and are looking at

ways to research tutor/student interactions and the effects of tutor training on student learning. My graduate work was in theoretical mathematics, so while I appreciate and value the educational research, I am not very well versed in that research field. I have been reading several papers this summer as part of this weekly reading group. Not only am I able to continue working with the people I met at these meetings, but I am learning a lot from the research papers and from the perspectives the other group members provide. These readings have provided many ideas for tutor training and my own teaching. Moving forward, these meetings may also give rise to research on tutor training and student learning in math resource centers.

- **Participating in a “quantitative group” to analyze the effectiveness of the Math Tutorial Lab and explore differences among institutions.** Several institutions are compiling usage and grade data from their math resource centers. The ultimate goal is to discover practices by centers and students that will lead to an increase in student learning and performance. Since there are a variety of practices in place (e.g. drop-in and appointment based tutoring) and many differences between the institutions and centers in general, this project is currently in an information gathering stage. From my participation in this group, I received a survey that I plan to give to all students who can visit the Math Tutorial Lab. The survey will be given at the end of the semester using ICON. In addition, to using the results to contribute to the multi-institutional analysis of math resource centers, I hope to receive information from students who do not use the Math Lab that much to see if there are any changes we can make to the Math Lab that would improve the services we offer to students.

Professional Development and Impact of Conference on RUME

In addition to the discussions about math resource centers, I was interested in research and conference talks that focused on the following areas, many of which are related to my teaching and service in the Department of Mathematics.

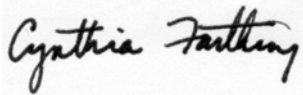
- **Developmental math courses and prerequisites for calculus.** Last semester I taught MATH:0100 *Basic Algebra I*, a course that is equivalent to a first algebra course in high school. I also work with incoming students to explain course prerequisites and analyze math placement scores. As a result, I am very aware that we have several students who enter the University of Iowa underprepared in mathematics. Instead of wishing that students would improve their math skills before graduating high school, I have accepted that we need to modify our courses in order to help these students be successful in university math courses so they can pursue any area of study they want. I have been talking with members of the Department of Mathematics about this, and I am very interested in assisting with redesign of some courses to improve outcomes for students.
- **Mathematical knowledge required for teaching, and in particular, how to develop knowledge for teaching for preservice teachers.** This area is critical to developing quality mathematics teachers to give students the best chance to learn and like mathematics throughout their education. I have recently started teaching MATH:1140 *Math Basis for Elementary Geometry* which is designed for future elementary teachers. I know there is a lot I can learn from mathematics education about developing the skills future teachers will need to be effective math teachers as well as modeling the sort of teaching we want our elementary teachers to use.

- **Graduate teaching assistant training.** I conduct a seminar for new TAs in mathematics each fall, and I have attended workshops on training graduate students to be effective teachers. Graduate student training is a key area of research in RUME. I have been able to improve my seminars for TAs from what I have learned from RUME presentations and workshops.
- **Social justice and equality in mathematics education.** In many ways, mathematics is an obstacle that keeps many people from accessing high paying jobs in science and technology. Currently, there seems to be an increased focus on identifying and removing the obstacles keeping underrepresented minorities from pursuing and persisting in mathematics studies. It is important for me to be a part of this discussion and to try to make our courses and the Math Tutorial Lab as welcoming and helpful to all students. There were many talks at RUME in these areas; I enjoyed listening to the discussion of research that is ongoing and hearing ideas from others on how we can improve mathematics education the math community to be more inclusive.

I am grateful to the Council on Teaching for the opportunity to attend the Conference on RUME this year. It was a valuable opportunity that has led to increased professional development for me. I plan to become more involved in the RUME community, and I will continue to use what I learn to help the Department of Mathematics and the University of Iowa.

Thank you for your support.

Sincerely,

A handwritten signature in black ink that reads "Cynthia Farthing". The signature is written in a cursive style with a large initial "C".

Cynthia Farthing, PhD
Director, Math Tutorial Lab
cynthia-farthing@uiowa.edu