RUME with a View Conference
Cultivating New Researchers on the Frontier of RUME

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Overview: Recent decades have seen increasing attention to and progress in research in undergraduate mathematics education (RUME). Relative to K-12 mathematics education research, which is more than a century old as a field, RUME is a young area, beginning to become visible for few decades. During these decades, the field has accumulated and has been disseminating research results while still addressing the need to understand the learning and teaching of undergraduate mathematics. However, we believe one related need, the development of new scholars to conduct the research, has become more pressing. As a step towards cultivating RUME research progress, the RUME with a View conference aims to create a network of scholars with various degrees of expertise and interests in RUME. This conference emphasizes an origination of new collaborations and strengthening of existing ones; hence, participation of novice researchers is central. The next generation of experts and leaders in RUME come from the current generation of graduate students, early-career RUME faculty, and mathematicians seeking to gain more experience and expertise in this field. The first RUME with a View Conference specifically, and with active intention, engaged these participants to strengthen their expertise and build collaborations. Through the collaboration of young and experience RUME scholars, the conference also produced a list of prior open research questions in five thematic plenaries. Information about these thematic areas and produced questions in each theme is presented below. In addition, the sixth plenary focused on grant writing tips and ideas.

Conference Information

- The first RUME with a View Conference was held at the University of Oklahoma on October 8-9, 2016.
- There were 210 recorded registrations prior to conference.
- 78 participants attended the thematic breakout sessions, and
- additional 15 participants attended the plenary sessions only.
- Among 93 participants, there were
  - 7 undergraduates,
  - 41 graduate students,
  - 5 post-docs,
  - 4 instructors/lecturers,
  - 20 assistant professors
  - 12 associate professors, and
  - 4 full professors.
- Thematic breakout sessions and plenary speakers who led these sessions were
  - Theme 1: Research in Students’ Learning breakout session led by Michelle Zandieh, Arizona State University.
  - Theme 2: Research in Pre/Business/Regular Calculus breakout session led by Marilyn Carlson, Arizona State University
  - Theme 3: Research in Problem Solving breakout session led by James Epperson, University of Texas at Arlington
  - Theme 4: Research in Equity in Mathematics Education breakout session led by Luis Leyva, Vanderbilt University
  - Theme 5: Research in Statistics and Quantitative Literacy breakout session led by Vince Melfi, Michigan State University
- The beginnings of Grant Writing session led by Estrella Johnson, Virginia Tech University

Post-Conference Survey Results

- As a result of participating at this conference, 63% (44 participants out of 70 who filled out the survey) stated that they gained sufficient or great overall knowledge on research in RUME.
- As a result of participating at this conference, 64% (44 participants out of 69) stated that they had sufficient or great gain in knowledge on different research areas in RUME.
- As a result of participating at this conference, 63% (44 participants out of 70) stated that they had sufficient or great gain in knowledge on different research areas in RUME.
- Overall
  - 41% (29 participants out of 70) stated that the breakout sessions were the most useful aspect of the conference for them.
  - 34% (25 participants out of 70) stated networking and getting to know other researchers in RUME was the most useful aspect of the conference for them.

Participants’ Comments

- I gained so much. First, it was wonderful to reconnect with members of the RUME community and be reminded of my passion for my research. Secondly, but arguably more importantly, as I am getting more interested in and concerned about equity issues, it was wonderful to form relationships and get resources that will help me start taking steps on the road to researching those issues. In particular, crafting research questions and thinking about research methods made the new line of research seem possible. Thank you so much. I really wish this conference had been around when I was a graduate student.
- I gained confidence in my ability to perform research in RUME, contacts within the RUME community that I feel like I can ask for help and guidance, ideas on where and how to generate good RUME research questions, and hope because so many awesome people are genuinely interested in (much needed) research in RUME.
- Plenaries, in which important scholarship in a particular field was surveyed and introduced, were of great help. This helped a newcomer like myself get a “road map” to areas of research I have less experience with.
- I most appreciated being able to talk and network with other participants. I learned a lot about grant-writing as well.

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Sample of Generated Open Research Questions

- Theme 1 - Student Learning
  1. What is the effect of perceived social roles of both students and instructors in IBL classrooms on learning outcomes?
  2. How do teachers’ use of informal/imprecise language affect students’ understanding of a specific topic (e.g. metonymy in calculus)?
  3. What do students mathematical journal entries, and specifically their use of language, reveal about their mathematical understanding?
  4. Do students persist in mathematics without “ah ha” moments? Why?
- Theme 2 - Pre/Business/Regular Calculus
  1. What is the role of students’ quantitative reasoning on how they conceptualize particular foundational ideas in pre/business/regular calculus? (Several researchers are working on this, but a lot of work remains to be done.)
  2. How do students’ mathematical identities (or affect generally) influence their engagement in pre/business/regular calculus?
  3. What is the nature of the professional knowledge base that informs effective instruction in pre/business/regular calculus at the undergraduate level?
- Theme 3 - Problem Solving
  1. How does working in a group affect problem solving?
  2. How is the problem-solving process impacted by or dependent upon classroom context?
  3. How do problem-solving norms develop in a classroom community?
  4. What role do external resources/tools (calculator, internet, book, etc.) play in student problem-solving practices?
- Theme 4 - Equity
  1. To what extent does teachers’ language use in undergraduate mathematics classrooms constrain or afford students’ learning opportunities?
  2. What forms do microaggressions take in undergraduate mathematics classrooms? How do students perceive these microaggressions? And what are the impacts on the students’ sense of belongingness?
  3. What are the key features of (STEM) learning communities that advance academic and social integration in undergraduate mathematics?
- Theme 5 - Statistics and Quantitative Literacy
  1. What is introductory statistics? What do these courses look like across the country? At different schools, for different purposes?
  2. In what ways do [people] understand major statistical concepts?
  3. What is the place of probability in statistics?
  4. How is QL instantiated at diverse institutions?