

*Texas State University
Department of Mathematics Colloquium
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3:30pm on Zoom*

**Taking an Instructional Innovation to Scale:
Characterizing, Supporting, and Evaluating Inquiry-Oriented Instruction**



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Abstract: Inquiry-oriented instruction has shown promise in regards to many features of student success, including conceptual understanding, affective gains, and persistence in STEM degrees. However, instructional change is difficult (especially at scale) and the research literature has documented a number of challenges instructors face when shifting their instructional practice. During this talk I will provide a characterization of inquiry-oriented instruction; discuss an instructional support model that was developed to support inquiry-oriented instruction in undergraduate mathematics courses; and present preliminary evaluation findings, drawing on a national sample of content assessment data, collected from 513 students at 46 different institutions. Analysis of this assessment data revealed no difference in the performance of men and women in the comparison sample; however, under the inquiry-oriented treatment, a gender performance difference was present – with men outperforming women. In an effort to understand this finding, I present related research literature on gendered experiences in collaborative settings and some of our ongoing analysis into the experiences of our students in these inquiry-oriented courses.

Bio Sketch: Dr. Johnson is an associate professor of mathematics at Virginia Tech. Her research focuses on the pedagogical practices of mathematicians, with the goal of better understanding and supporting high quality, ambitious teaching in undergraduate mathematics classrooms. She has worked extensively on investigating and supporting mathematicians as they work to implement inquiry-oriented instructional materials (NSF #143195). Additionally, Dr. Johnson has worked on large-scale national survey projects investigating instructional practice, and influences on practice, in undergraduate STEM education (e.g., NSF #1430540, NSF #0910240, NSF #1726281). More information about her research can be found at <https://estrellajohnson.com/>.