Entangling and Disentangling Inquiry and Equity: Voices of Mathematics Education and Mathematics Professors

Amanda Jansen & Center for Inquiry and Equity in Mathematics
University of Delaware & Education Development Center

Inquiry – asking and investigating answers to meaningful questions (Brown & Walter, 2005) – is promoted for multiple purposes across mathematics education, including developing meaningful understandings of mathematics (Goldin, 1990), fostering productive dispositions among learners such as self-efficacy in mathematics (Cerezo, 2004), or promoting powerful identities (Melville, Bartley, & Fazio, 2013). Teaching approaches aligned with inquiry include guided reinvention (Freudenthal, 1973; Gravemeijer, Cobb, Bowers, & Whitenack, 2000), discovery learning experiences (Goldin, 1990), or problem-based learning (Roh, 2003).

Tang and colleagues (2017) asserted that common themes across inquiry-based mathematics courses, such as student ownership of developing mathematics knowledge or collaborating with peers, can align with four dimensions of equity (access, achievement, identity, and power) (Gutiérrez, 2002). However, the enactment of inquiry-oriented teaching alone does not ensure equitable outcomes or equitable experiences for students (Johnson et al., 2020; Lubienski, 2002).

In this poster, we extend Tang and colleagues' (2017) reflections on alignment between inquiry and equity in pursuit of the following research question:

How and in what ways can inquiry and equity be viewed as intersecting?

Data for this study consists of interviews with 24 professors who identify as mathematics education professors and/or mathematics professors. These professors participated in a week-long summer institute, during which they pursued an inquiry project and reflected equity in the experience of inquiry. During the institute, there appeared to be a shared perspective that inquiry and equity could not be separated. We examined this perspective through two interviews with each participant, the second interview being a member check, and by using a co-writing methodology (Manning, 2018).

Members of the Center for Inquiry and Equity in Mathematics:

Mathematics Education Professors
Mollie Applegate, Iowa State University
Kristen Bieda, Michigan State University
Martha Byrne, Sonoma State University
Theodore Chao, Ohio State University
Jon Davis, Western Michigan University
Teresa Dunleavy, Vanderbilt University
Maisie Gholson, University of Michigan
Steven Greenstein, Montclair State University
Frances Harper, University of Tennessee Knoxville
Hanna Haydar, Brooklyn College CUNY

Mathematics Education Professors
Naomi Allen Jessup, Georgia State University
Crystal Kalinec-Craig, The University of Texas San Antonio
Alison Marzocchi, California State Fullerton
Marrielle Myers, Kennesaw State University
Randolph Philipp, San Diego State University
Paulo Tan, Johns Hopkins University
Preety Tripathi, SUNY Oswego
Eva Thanheiser, Portland State University
Jennifer Wolfe, University of Arizona

Mathematics Professors
Pamela Harris, Williams College
Terrance Pendleton, Drake University
Oyita Udiani, Virginia Commonwealth University
Shanise Walker, University of Wisconsin Eau Claire
Kamuela Yong, University of Hawaii West Oahu

Leadership Team
Sarah Sword, Education Development Center
Michael Young, Carnegie Mellon
Amanda Jansen, University of Delaware
Al Cuoco, Education Development Center
Aris Winger, Georgia Gwinett College
Miriam Gates, Emmanuel College
Anne Marie Marshall, Lehman College

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categories of intersections	types of intersections
Equity possibilities and dilemma are always present during inquiry	Structural: Inquiry is not politically neutral. It is culturally situated, racialized, and genderized. It reflects values and choices about whose mathematics is practiced.
	Interpersonal: Power dynamics and status dynamics are always a part of interactions during inquiry.
Equitable Inquiry: Visions for how collaborative inquiry can operate so that it is more equitable.	Recognizing and honoring the strengths of one another, working toward leveling status.
	Offering choice and flexibility in the inquiry question selection and inquiry process.
	Engaging in personally meaningful inquiry.
	Accessing mathematics content or practices.
	Engaging in interdisciplinary inquiry
Inquiry For Equity: Inquiry conducted with the goal of achieving greater equity	Engaging in socially-based inquiry questions
	Supporting one's own students through conducting inquiry

"You can't separate out the way in which mathematics in a social context is a social practice. And so the inquiry itself is mathematical, but it's also historical and political and socially situated.... even the multiple ways of knowing within mathematics could be informing the inquiry approach that the people are using. So it's not this thing that exists outside of the people who are doing it

"I think it's about voice. A lot of the work that I've been doing this summer at least, has been whose voice is filling the space. ... I'm struggling and trying to figure out how do I bring equity into my practice when I talk to students about inquiry, mathematical research and sharing ideas, that doesn't continue to center people who are more prone to speaking."

"So, in our group, we did a great job of not positioning one person as more knowledgeable than each other but really seeing the brilliance in everybody and building on their own expertise. So, even in the ways in which we dialogue and have a conversation, I feel like it was... We were building on each other's ideas, which was very nice. So, I even think of the ways in which we engage in mathematical ideas and shared them. I think we did it from a very equitable space because we didn't necessarily shut someone's thinking. We didn't interrupt their thinking or shut them down."

"I think allowing us to select our own topic to investigate. Allowing us to choose how we communicated that to demonstrate what we learned, to choose our own representation. Allowing us to work how we want it to work. So just even in the physical space, we were inside, outside,..."

"I just love that moment of math problem solving. Like, I love to do mathematics. And there's a love, I use the word love in that statement. And I got to do something that I cared about. I'm driven by my own question around mathematics."

"I think about ... giving kids access to meaningful mathematics. Doing something more and a lot of times, for me, that might mean bringing down... more interesting mathematics in a way that kind of exposes kids to advanced topics that they usually don't get access to. Equity can also be about what kids are generally exposed to and what they have access to. For me, that was trying to bring some calculus into it."

"Sometimes we were able to identify specific math content that could help us to understand issues of gentrification. And sometimes it was more social sciences or history or other disciplines. ..o the inquiry that's happening is a combination of all of these disciplinary ways of knowing that have formed how you approach the inquiry."

"I think part of what you can do is embed dimensions of equity in how I would think about issues in justice within the mathematical work these students are doing. For me, it was trying to figure out a space to kind of marry both the curiosity and strategies for engaging in mathematical ideas with a social context that actually helps students think about issues of equity."

"The question that I was seeking to explore was one that was personally interesting to me mathematically, but it was really driven by what's interesting to my students mathematically. This was a question that surfaced from our mathematical interactions. And I felt like, again, it's about their agency. What is it that they want to know and get clear about?"

These perspectives above reflect the range of points of view in our group. Not every person reported every perspective here.