

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

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*This study describes how mathematics education professors and mathematics professors conceptualize relationships between inquiry and equity. After participating in a week-long summer institute, 24 mathematics education professors and mathematics professors were interviewed twice (initial interview and member check). Then, participants engaged in co-analysis and co-writing to construct a framework that provides structure to the complex set of stances about how equity and inquiry intertwine. This framework, which extends the work of Tang and colleagues (2017), illustrates ways that the process of inquiry could be more equity-minded (equity in inquiry) and shows that inquiry could be conducted to seek outcomes of greater equity (inquiry for equity). Findings also illustrate that equity opportunities, challenges, and tensions are always present in inquiry. In addition, this study illustrates the value of (and a process for) mathematics education professors and mathematics professors to work together to understand each other's perspectives during collaborations.*

**KEYWORDS: MATHEMATICS, INQUIRY, EQUITY**

How can inquiry be equity-minded? Inquiry is the activity of posing a problem (Silver, 1994) or asking a personally meaningful question (Brown & Walter, 2005) and pursuing an answer to it. Mathematics education professors and mathematics professors could value inquiry for at least two professional reasons: (a) as an approach to teaching and learning and (b) for their research and scholarship. As we engage in inquiry, equity opportunities and dilemmas appear.

Mathematics can be learned through inquiry. In the context of mathematics classrooms, teachers can promote inquiry through approaches such as guided reinvention (Freudenthal, 1973), discovery-learning experiences (Goldin, 1990), or problem-based learning (Roh, 2003). Inquiry instruction can have multiple benefits for learners, including developing meaningful understandings of mathematics (Goldin, 1990), productive dispositions among learners (e.g., self-efficacy in mathematics; Cerezo, 2004), or powerful identities (Melville et al., 2013).

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As we practice inquiry during collaborative research or in the context of teaching, we may strive to be equity-minded. According to Tang and colleagues (2017), teaching mathematics through inquiry could foster greater equity. They aligned inquiry practices in mathematics classrooms with Gutiérrez's (2012) four dimensions of equity: access, achievement, identity, and power. They asserted that when inquiry teaching practices align with active learning (e.g., promoting student ownership, student generation of knowledge, and peer involvement through collaboration), all four of these dimensions of equity can be addressed.

If inquiry is not intentionally enacted to be more equity-minded, inequities could be perpetuated. A contribution of this paper is a framework of relationships between inquiry and equity. This framework provides structure for thinking about the complex practice of inquiry and how it can (or might not be) more equity-minded. This analysis extends the work of scholars who have considered the role of equity in mathematics inquiry (Tang et al., 2017) and supports others who want to foster inquiry in ways that are more equity-minded.

We employed a co-writing methodology (e.g., Manning, 2018) for this analysis. Dialogue and collaboration between mathematics education professors and mathematics professors can have multiple benefits, including improvements in undergraduate education. This collaborative work is one example of such dialogue and collaboration. Thus, another contribution of this study is the co-writing methodology that we describe in this paper.

## Research Context

What happens when a group of mathematics education professors and mathematics professors come together to engage in inquiry? What if members of this group of professors also express a commitment to equity that they live out in their professional work? We learned that one important step is to seek to understand the range of perspectives held among group members. Specifically, we sought to understand different ways that we thought about how equity intertwined with engaging in inquiry.

Twenty-four professors attended a summer institute to launch the Center for Inquiry and Equity in Mathematics. The institute was facilitated by a team of six. The facilitation team included representation from mathematics education and mathematics programs. Mathematics education professors were recruited to apply to attend the institute, and 19 participants were selected from applications. Below, we share a quotation from the recruitment handout.

We know many mathematics education faculty have thought deeply about issues of equity and about what mathematics is; however, we believe that these issues are so core to the work of mathematics education that we as mathematics educators need spaces for continued growth. This program is for those mathematics educators who wish to continue to interrogate what mathematics is and who is welcome to do it – in community with other educators and in service of empowering future teachers to do the same work.

Five mathematics professors, invited among those in the Mathematicians of Color Alliance, also participated in the institute. Across the following school year, the mathematics professors interacted with the mathematics education professors and collaborated to enhance learning experiences for undergraduate teacher candidates.

Participants conducted inquiry during the summer institute. Inquiry projects addressed questions about sociopolitical issues (mathematics of gerrymandering and environmental justice), mathematics underlying how games are played (gambling [craps] and card games or

board games [*Spot It!*]), their wonderments (whether or when 0.999 repeating is or is not equal to one and understanding happy numbers), or questions their students had posed about mathematical relationships (understanding why Descartes' rule of signs works intuitively).

Participants reflected together about ways that equity was experienced (or not) in their inquiry during the summer institute. During the institute, this group of mathematics education professors and mathematics professors expressed a taken-as-shared understanding that inquiry and equity cannot be separated. We then engaged in ongoing work together, during the institute and beyond, to unpack that idea because people seemed to agree for different reasons. This paper is a product of our ongoing reflection on how inquiry and equity intertwine.

In this paper, we also seek to provide insight for those who would like to build collaborations between mathematics education professors and mathematics professors. When we seek to understand one another, we have a place to begin. The process of trying to understand one another is an equity-minded practice. We avoid making assumptions about each other. We put ourselves in each other's shoes. We open our minds to multiple viewpoints. (The use of "we" throughout this paper refers to our collective perspective, the first author and the participants in this project, with whom the first author endeavored to co-write this paper [e.g., Manning, 2018].) The co-writing methodology describes a process for learning to understand one another, and the framework we present offers what we learned from each other about the range of ways that inquiry and equity can intertwine.

### **Inquiry and Equity in Urban Mathematics Education**

Inquiry as a process of teaching and learning has long been a part of the history of mathematics education reform, such as learning mathematics through inquiry and problem solving (National Council of Teachers of Mathematics [NCTM], 2000). The combination of inquiry as an activity and inquiry in mathematics instruction is described below by Staples (2007):

Inquiry is a practice or stance and indicates a particular way of engaging with and making sense of the world.... Inquiry into mathematics involves delving into mathematical ideas and concepts and trying to understand the structure, power, and limitations of mathematics. Inquiry with mathematics involves using mathematics as a tool to make sense of problem situations and come to some reasonable resolution.... Learning results from, and is evidenced by, student participation in both standard disciplinary practices (e.g., justifying, representing algebraically) and an array of other practices of mathematical communities (e.g., questioning, communicating, informal reasoning). (p. 163)

The process of inquiry involves learning new mathematics through the activity of engaging in novel tasks, making conjectures, engaging in reasoning, and justifying (Rasmussen & Kwon, 2007). Learners' ideas are central to learning and developing understanding in inquiry-oriented instruction (Kuster et al., 2018). Rationales for engaging learners in inquiry have included providing learners access to practices of mathematicians (Lampert, 1990), which can support the development of productive identities, or providing access to opportunities to make sense of mathematical concepts (Goldin, 1990). Whether we view inquiry as promoting equity (or not) depends greatly upon how equity is defined as well as how inquiry is enacted.

Equity has long been expressed to be a commitment in the field of mathematics education, but the commitments are enacted in various ways. The first guiding principle – equity – in the NCTM's (2000) *Principles and Standards for School Mathematics* reads, "Excellence in

mathematics requires equity – high expectations and strong support for all students” (p. 11). However, this is only one way to view equity in mathematics teaching and learning. Gutiérrez (2012) described four dimensions of equity in mathematics teaching and learning – two along a dominant axis (access and achievement) and two along a critical axis (identity and power).

The dominant axis refers to commonly held perspectives of providing access to particular learning conditions (e.g., material or human resources, particular learning experiences, or certain mathematics practices) and considering whether achievement, or student outcomes, differ when groups of students are disaggregated by race, gender or sex, socioeconomic class, or by any marginalized group in comparison to the majority (Gutstein et al., 2005). Regarding access, inquiry-oriented teaching practices could include providing learners with access to opportunities to engage in higher order reasoning and justification (Mueller & Maher, 2010). Perhaps some might value inquiry if it reduces differences in achievement between groups, but perhaps inquiry also has value for achievement when new forms of knowledge can be constructed. *Gap gazing* (Gutiérrez, 2008) or examining differences in achievement between groups of students does not question testing systems that generate the outcomes.

The critical axis of equity directs attention to how opportunities to engage in doing and learning mathematics can create or shut off possible identities and can have the power to create change, transform society, address injustices, and transform the discipline of mathematics itself. According to Boaler and Greeno (2000), “Students do not just learn mathematics in school classrooms, they learn to *be*...” (p. 188) mathematics learners. Inquiry practices in school affect how students see themselves (and how others see them) as doers of mathematics (Aguirre et al., 2013). School practices can narrow boundaries of ways of thinking (de Freitas & Sinclair, 2020; Popkewitz, 2004) or widen them, which can constrain or open possibilities for identities to be enacted and valued. Mathematics can be used to investigate sociopolitical issues as a tool toward change (Felton-Koestler, 2020). Through inquiry, students can learn to “read the world” (Gutstein, 2003, p. 44) as they use mathematics to learn about social forces that contribute to the marginalization of some people over others (Martin et al., 2010). The multiple conceptions of equity provide different insights into whether and how inquiry can be equity-minded.

### *Inquiry Instruction and Efforts Toward Equity*

Efforts to enact inquiry-oriented instruction may still fall short of achieving equity goals. In a study of an inquiry-oriented abstract algebra course at the undergraduate level (Johnson et al., 2020), women did not perform as well as men on an outcome assessment. The differences were attributed to differences in women’s participation rates across classes (Reinholtz et al., 2022), which highlights the importance of considering how differential opportunities to participate are constructed in inquiry-oriented teaching. In his research on African American parents’ experiences with mathematics, Martin (2006) used the parents’ voices to illustrate the nature of racialized experiences in mathematics learning. The parents spoke of “how the socially constructed meaning for race comes to be a deciding factor in who gets to do mathematics and who does not” (p. 223). An important factor in equity-minded inquiry is attending to who has the opportunity to participate and in what ways.

Rubel (2017) investigated mathematics teaching practices designed to address equity and identified that some teachers struggled to enact teaching practices that related to identity and power. She argued for greater attention to race and political knowledge in mathematics teacher preparation. Mintos et al. (2019) reported that secondary mathematics teacher education

programs do not always address critical dimensions of equity (identity and power), focusing instead on access and achievement. A greater awareness of the role of equity in inquiry involves attention to critical dimensions of equity.

### *Urban Mathematics Education as Location*

Whether relationships between inquiry and equity are relevant for urban mathematics education depends on how we conceptualize *urban mathematics education*. This phrase can refer to a geographic location, specifically a densely populated region with a unique context of human and cultural diversity in race, ethnicity, language, socioeconomic class, religion, disabilities or abilities, sexual orientation, and gender expression (Stinson, 2020) as well as its intersections. We recognize that *urban* has historically been used as coded language for people of color and for people with fewer economic resources (Shah et al., 2021). We do not conceptualize *urban* in this way, nor do we conceptualize it as monolithic. We align with Martin et al.'s (2010) assertion of the importance of analyzing urban mathematics education within its complex social, historical, and political contexts. Understanding relationships between inquiry and equity is also relevant when we work with and in urban communities because it is important to consider who may be served or not be served in inquiry practices. As we strive for anti-racist and anti-oppressive practices in mathematics education, we aim to serve communities that have been historically underserved and aim to dismantle systems that have allowed racism and oppression to perpetuate.

Following Larnell and Martin (2021), we “envision a form of mathematics education that is worthy of those who encounter it, unlike traditional forms of mathematics education that are fundamentally structured to convey privilege to those few students deemed worthy” (p. 358). We view urban spaces as sites where sophisticated and authentic inquiry does and can occur rather than viewing urban contexts through a deficit lens (cf., Larnell & Bullock, 2018). Facilitators of inquiry, including those who work in urban settings, would benefit from awareness of equity challenges and opportunities so that mathematics education focuses on “increasing their opportunities for success without undermining their cultural practices” (Larnell & Bullock, 2018, p. 52).

### *Urban Mathematics Education as a Political Project*

Urban mathematics education is a political project focused on envisioning anti-racist and anti-oppressive spaces of mathematics teaching and learning (cf., Larnell & Bullock, 2018; Larnell & Martin, 2021; Martin & Larnell, 2018). Our engagement in this work of conceptualizing equity in inquiry is a process of engaging in such work because we collectively shared and developed our political knowledge of mathematics teaching and learning (Gutiérrez, 2013). Following Gutiérrez's (2013) description of political *conocimiento*, we worked to deconstruct deficit discourses when engaging in inquiry and engaged in our inquiry to build solidarity with and commitment to our students.

According to Larnell and Martin (2021), the political project of urban mathematics education research incorporates the use of research methodologies that consider how knowledge is constructed and potentially rejects dominant traditions of social science research. Anti-oppressive research “interrogates the logic models of knowledge production” (Larnell & Martin,

2021, p. 356). In our methodology section of this paper, we elaborate upon how we designed our research activity to co-construct knowledge as a community of scholars.

### *Mathematics Education Professors' and Mathematics Professors' Perspectives on Equity*

Researchers have begun to address a call from McLeman and Vomvoridi-Ivanovic (2012) for more research into mathematics teacher educators' practices to work toward equity; initial findings revealed a focus on access among mathematics education professors. Vomvoridi-Ivanovic and McLeman (2015) found that among a group of 23 participants, mathematics education professors expressed varied and multiple views of equity, but almost half of the views on equity emphasized access (to both high quality instruction and resources). Suazo-Flores and colleagues (2020) conducted a survey ( $n = 170$ ) on behalf of the Association of Mathematics Teacher Educators and found most mathematics educators reported that they conceived of equity as access. The next most frequently mentioned conceptions of equity included disrupting the status quo (system needs to change because it is inequitable for marginalized learners), promoting positive mathematics identities (including K–12 students and teachers seeing themselves represented in mathematics), and cultural ways of knowing (teachers' backgrounds and cultural ways of knowing are valued). There is a need to work toward greater emphasis on critical dimensions of equity in future teachers' learning; this endeavor can be shared among mathematics professors and mathematics education professors because they all affect mathematics teacher education.

Research is limited on mathematics professors' perspectives on equity in the context of mathematics teaching and learning. Bryant and colleagues (2018) wrote about their experiences as mathematics professors attending a summer workshop about equity and participating with mathematics education professors. They illustrated the following examples of understandings about equity that were co-constructed during this summer workshop: (a) Equity is more than creating access to learning opportunities and extends to systemic problems such as tracking and placement of students in courses. (b) Equity involves recognizing each learner's humanity and identity. (c) Equity involves interrogating where power is located in classroom interactions. This work illustrates what can be learned when mathematics professors and mathematics education professors reflect together about equity.

Individuals have had unique experiences and knowledge bases that shape their thinking about equity (Foote & Bartell, 2011). Different definitions of equity are likely to be useful for different purposes (Gutstein et al., 2005). To explore how inquiry and equity intertwine, a group of mathematics education professors and mathematics professors collaboratively pursued answers to the following research question: How and in what ways do mathematics education professors and mathematics professors describe intersections between inquiry and equity?

## **Methods**

A contribution of this work is that we co-developed and engaged in a process of co-writing (e.g., Manning, 2018; Short & Healy, 2016; Siry & Zawatki, 2011) to use an equity-minded approach to inquire about how equity and inquiry intertwine. We treated this research project as an opportunity to continue dialogue among participants beyond a summer institute and extend our collaborative learning. Our endeavor to position the group as a collective generator of knowledge was an intentional choice to move toward anti-oppressive research practices. Below,

we elaborate on this process. (A table presenting a timeline of implementation steps for this study is in Appendix A.)

*Methodology: Co-Constructing Results by Co-Writing with Participants*

Co-writing can share the power to generate knowledge with participants. Cooperative inquiry, or co-constructing research with participants, occurs when everyone involved explores topics of mutual investment. The coordinating researcher is not positioned as the authority with the insights, and participants in the study have voices in the conclusions reached (Short, 2018). This is a democratic approach to conducting research and building knowledge (Harding, 2020). When participants have more voice and control over what ends up in print, the write-up of the study is more aligned with the view of participants (Heron, 1996). The following quote resonated with the first author:

I often feel unsettled when writing about experiences of others.... I wonder if I can ethically represent a participant's experience, if I am presuming too much or wielding too much privilege in the act of trying to write about the experiences of others.... Thinking critically and reflexively about our own positionalities and relationships with participants are important parts of doing research in pursuit of social justice. (Manning, 2018, p. 745)

Our co-writing approach draws from feminist and post-structural perspectives on conducting research. From these perspectives, how we represent research participants can be an ethical struggle due to navigating one's relationships to participants and our responsibilities to each of them (Gonick & Hladki, 2005). Co-writing aligns with a feminist approach to research because the process of conducting research interrogates objectivity and examines epistemic authority and privilege. According to Harding (2020), "Knowledge produced by feminist research must contribute to pushing back intersectional relations of power, inequality, and oppression felt by those who were the focus of the research" (p. 2).

The first author of this study strove to write with rather than about participants. Co-writing was an opportunity for everyone involved in the research study to enact compassion for other participants and to heighten awareness of how other people experience the world that we share (Short & Healy, 2016). Goals of co-writing include dismantling or flattening hierarchies between researcher and participants, seeking a plurality of perspectives (rather than a false notion of a single truth), and decreasing the likelihood that those who are a focus of the research will feel unequal and oppressed (Harding, 2020; Siry & Zawatski, 2011). After all, "When you write about yourselves and those close to you, you are constantly aware of the impact of your words" (Short & Healy, 2016, p. 192). Many of the participants had known one another prior to the summer institute, and they would continue to intersect professionally in the future. It was a worthy endeavor to work to foster an ongoing community of learning through co-writing.

Co-researching and co-writing began during the data analysis stage; specific details are described below. The first author constructed the research question and goals of the study with the facilitation team of the summer institute. Data were generated from two interviews: an initial interview and a member check interview.

*Participant recruitment and selection.* As described earlier in the paper, 19 mathematics education professors were selected from an applicant pool to attend the summer institute, and, in addition, five mathematics professors were invited to attend the summer institute. Opportunities for mathematics education professors to apply to attend were publicized through major

organizations in mathematics education (websites and listservs), and advertisement handouts were distributed at the 2018 fall conference for the North American chapter of the International Group for the Psychology of Mathematics Education. In addition to text from the recruitment flyer presented above, prompts from the application appear in Appendix B. Mathematics education professors were selected based on their specificity of descriptions of their efforts to work on both inquiry and equity. Participating mathematics professors were members of the Mathematicians of Color Alliance, and they were invited because of their efforts to engage in outreach to improve access to mathematics inquiry for people of color and their expertise in conducting research in mathematics, often collaboratively with their students.

*Participant demographics.* Twenty-four professors participated in this study; 79.2% identified as mathematics education professors ( $n = 19$ ) and 20.8% identified as mathematics professors ( $n = 5$ ). Of the participants, 54.2% worked in education departments ( $n = 13$ ) and 45.8% worked in mathematics departments ( $n = 11$ ); both types of departments could employ mathematics educators. In addition, 62.5% of participants identified as women ( $n = 15$ ) and 37.5% identified as men ( $n = 9$ ). Regarding racial demographics, 25% of participants identified as Black or African American ( $n = 6$ ), 16.7% identified as Asian, Asian American, or Pacific Islander ( $n = 4$ ), 4.2% identified as Latinx ( $n = 1$ ), 4.2% identified as mixed race ( $n = 1$ ), 45.8% identified as White ( $n = 11$ ), and 4.2% did not report their race ( $n = 1$ ). At the time of the summer institute, 4.2% were post-doctoral researchers ( $n = 1$ ), 62.5% were at the rank of assistant professor ( $n = 15$ ), 20.8% were at the rank of associate professor ( $n = 5$ ), and 12.5% were at the rank of full professor ( $n = 3$ ). The first author was a member of the facilitation team, and she identifies as a White, female, full professor of mathematics education in an education department.

*Initial interviews: Data collection.* Initial interviews of institute participants ( $n = 24$ ) took place in November and December of 2019. The interview protocol was designed by members of the Center for Inquiry and Equity in Mathematics's facilitation team. The interviews were conducted by members of the facilitation team through video calls, which were audio recorded and transcribed. Initial interviews lasted approximately 45–60 minutes.

Interview questions were written to explore participants' experiences in the institute as well as their thinking about inquiry and equity. (See Appendix B for the set of interview questions for the initial interview and the member check interview.) We targeted a subset of responses to these interview questions for this analysis. (Focal questions in the initial interview are indexed with an asterisk [\*] in Appendix B.) An example focal question was the following: "If you were to consider where equity was in your mathematical inquiry project experience at the institute, what would you say?"

*Initial interviews: Data analysis.* Our first phase of data analysis followed procedures of qualitative content analysis (Schreier, 2012). In qualitative content analysis, after identifying a research question, the next step is to select material for analysis. To select material to analyze, members of the facilitation team identified segments in the initial interview transcripts that included data aligned with research goals. We identified line numbers in the interviews when participants spoke about equity in relation to inquiry activity.

Next, a coding frame was built from the data. Members of the facilitation team examined the selected data and constructed initial conjectures naming ways in which participants characterized how inquiry and equity could be intertwined. Conjectures for 13 out of 24 participants were collaboratively constructed by multiple members of the facilitation team. Conjectures for the rest of the participants' interviews were constructed by the first author,



informed by the previous collaborative work. These conjectures were a first step toward constructing codes and were useful for member checking.

*Member check interviews: Data collection.* Member check interviews were conducted in the summer of 2020 by the first author. Prior to these interviews, each participant was emailed excerpts from their initial interview that represented their thinking about how inquiry and equity were or could be integrated. During this interview, participants were asked to interpret their quotes. The interviewer presented each participant with conjectures about their perspective on how inquiry and equity were integrated and asked them to comment on and share whether they still held this perspective. Participants responded by elaborating upon the conjecture and quotes, providing further detail, or by revising their perspective.

Participants chose pseudonyms at the end of member check interviews. Initially, when inviting the participants to engage in research, we did not plan to co-write, so our consent forms indicated that results would be reported using pseudonyms. Additionally, not all participants engaged in co-writing to the same degree. To protect the identities of participants who were less active as co-writers, we maintain the use of pseudonyms in results.

*Member check interviews: Data analysis.* After the member check interview, the first author drafted a set of codes that were applied to both interviews. Thus, the coding process was both emergent and deductive. The deductive codes were informed by the literature (e.g., Gutiérrez's [2002] dimensions of equity, such as the roles of access and power in the process of conducting inquiry). Emergent codes described themes repeated by more than one participant. Examples of codes include inquiry and equity intertwining in *socially based mathematics questions* (e.g., mathematics for social justice) or opportunities for *choice and flexibility*. After trying this coding frame, we modified our process, which is another common phase of qualitative content analysis.

Reducing data analysis to coding appeared to fragment the data in ways that did not illustrate the complexities of participants' perspectives, which became clearer through dialogue with participants about data analysis in research meetings (fall 2020, described below). Instead, we shifted to explanatory narrative inquiry, which is used to seek explanations for why things occur (Polkinghorn, 1995). We sought a holistic approach to content analysis that examined participants' stories as a whole, consisting of parts (Lieblich et al., 1998); the whole was a story of inquiry and parts were connections to equity. Thus, constructing thicker descriptions of participants' perspectives at the case level was more illustrative than applying a set of codes.

Following Foote and Bartell (2011), in the winter of 2020–2021, the first author wrote research texts for each participant's interview. A research text summarized a holistic narrative of participants' stances on how inquiry and equity intertwined and included quotes from both interviews to justify the summarized stances. These research texts were shared with participants for comment; two-thirds of participants replied with edits to language used to characterize their thinking or confirmation and agreement with interpretations of their thinking. Stances in the research texts served as a foundation for the framework of the paper, presented in Table 1, which was developed and refined in meetings with participants.

### *Co-Writing*

Co-writing began after member check interviews. Participants were invited to attend monthly Zoom meetings in August, September, and October of 2020. (Two meetings were held in October by participant request.) Of the participants, 70.8% attended at least one of these

meetings, and 20.8% attended multiple meetings in the fall of 2020. At the meetings, emerging findings were shared on collaborative documents (e.g., Google Slides and Google Docs), discussed, and refined, both verbally and in writing. After each meeting, the first author synthesized ideas about both interpreting data and the process of conducting the research. For instance, at the September meeting, a participant suggested that our work could be framed as being conducted with co-research methodologies. The first author took up this suggestion, read about co-research, and used what was learned to further guide the research process. Participants' asynchronous comments on their research texts, as described above, also supported co-writing.

During the next phase of co-writing, in the spring and fall of 2021, multiple drafts of the paper were shared with participants for feedback; 62.5% of participants ( $n = 15$ ) engaged in co-writing activities during this phase, and 45.8% ( $n = 11$ ) participated multiple times. Participants reviewed and revised a conference proposal asynchronously, met synchronously to discuss authorship principles and practices, and met synchronously to launch a process of providing feedback on drafts. Comments were provided on the draft asynchronously in the late spring, and then the group met early in the summer to discuss the feedback. The first author revised the paper, and asynchronous feedback was sought on the revised draft in the fall. The first author and a participant co-presented these findings at a conference (Jansen & Center for Inquiry and Equity in Mathematics, 2021).

We submitted the initial draft of this paper in January 2022, and we received reviews in May 2022. The first author shared the reviews with all participants and invited them to meet and discuss how to revise the paper. Two revision meetings were held in the summer of 2022; 25% of participants participated in these meetings, and 4.17% attended both meetings about revising. During these meetings, we generated ideas of how to respond to specific requests for revision and shared additional readings that could inform the paper in light of revision requests. One of the foci of the second revising meeting was to share ideas generated from additional reading. The revised paper was sent to participants to elicit feedback prior to submission. After the revised paper was accepted with minor revisions, the first author made the revisions and sent the text to the participants for asynchronous feedback.

## Results

The results represent an aggregated set of ideas across the participants. It is not the case that every person in the group agreed with every one of these themes or the thoughts expressed within them. Instead, the results are a union of what the individuals reported. There were three primary themes across the data about the intertwined nature of inquiry and equity. Participants recognized that possibilities and dilemmas for equity are always present during inquiry. In addition, distinctions were made between equity-minded inquiry (as a process) and inquiry conducted to achieve equity (as an outcome).

### *1. Equity Possibilities and Dilemmas Are Always Present during Inquiry*

We can develop greater awareness and attention to equity during inquiry. While engaging in inquiry, there are implications for equity that some participants reported as being constantly at play, whether inquirers are aware of the equity implications or not. Inquiry activities are never politically neutral and are imbued with power and status dilemmas.

## 2. *Equity in Inquiry*

Equity in inquiry is a process of conducting inquiry that is worth striving toward. It is a vision for how participants wanted the activity of inquiry to operate, particularly when conducted collaboratively. They reported that inquiry would be more equitable when collaborators (a) recognized and honored one another's strengths, (b) had choice and flexibility about choosing an inquiry question and choosing how they would engage in the process of inquiry, (c) had the opportunity to pursue a line of inquiry that is personally meaningful or interesting, (d) had access to powerful mathematics content or practices, and (e) engaged in inquiry in ways that incorporated interdisciplinary perspectives.

## 3. *Inquiry for Equity*

Inquiry for equity addresses the goal or intended outcome of conducting inquiry such that the practice of inquiry moves us in the direction of achieving greater equity. One way that inquiry could seek equity was (a) in the nature of questions pursued in inquiry. Socially based inquiry questions, such as questions aligned with mathematics for social justice, could provide insight on working toward equity. In addition, (b) participants conducted inquiry that would allow them to support their students by improving their teaching, which could help address equity by reaching more students.

[Insert Table 1 here]

### *Equity Possibilities and Dilemmas: Always Present during Inquiry*

Participants described that opportunities for equity or inequity were inherent in any inquiry activity, both structurally and interpersonally.

*Structural: Inquiry is not neutral.* Participants reported that inquiry is culturally situated and never politically neutral, which was a structural reason why inquiry and equity are intertwined. Participants saw inquiry as always racialized and genderized, reflecting values and choices about whose mathematics is practiced (including whether it is only mathematics of the dominant culture). Participants shared the following:

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, when we're talking about learning and doing mathematics. (Katherine, member check interview)

There is no decontextualized math task for me.... Even if it's adding two two-digit numbers, I can think about where the equity is in terms of how can I value a child's invented algorithm that might not necessarily have the spaces to be able to be seen as smart in mathematics? (Alexis, initial interview)

Ways of knowing mathematics reflect the people, context, and situations in which mathematics is practiced and conducted. According to James (initial interview), "The equity lies in these kind of ancestral knowledges, right? That are not tapped into, in favor of the dominant math if you will. So I think that to me is important, right?" Participants talked about how mathematical

activity reflects standpoints of ways of knowing and doing mathematics. In his member check interview, Charles said, “When one is doing mathematics, one can pose questions about what assumptions are we making about the nature of mathematics, about whose mathematics it is....” Whose mathematics is being centered in mathematics classrooms? If it is always mathematics from a dominant cultural perspective, then a wider range of ways of knowing are not being valued.

It really matters who gets to create mathematics, not just learn mathematics. And that is the space where I think inquiry and equity come together because inquiry is for me, a big part of it, is around this authoring of mathematics in an agency to creating mathematics, not just, I’ve been told a procedure and I’m going to practice it and master that procedure. (Claire, member check)

Opening up opportunities for learners to inquire creates possibilities for learners to author mathematics, so it is truly theirs.

*Interpersonal: Power and status dynamics during interactions.* The second way that equity was identified as always present in inquiry was interpersonal. Equity-minded inquiry honors participants’ voices and strengths. Power dynamics and status dynamics are always a part of interactions with others during collaborative inquiry, so it is important to develop awareness of how interactions can be conducted with equity in mind.

Participants, such as Carmen, Eric, and Hazelle, reflected about how they think about equitable interactions during inquiry. Carmen spoke about how she thought about equity when interacting with students on mathematics research.

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. (Carmen, member check interview)

One way to strive toward equity during inquiry is through centering the voices of those who are not always heard. Eric shared about equity challenges during small group interactions among students when he facilitates inquiry as an instructor.

The equity isn’t naturally going to just happen because of the inquiry. And something I have to do as a teacher when I have students working in small groups is make sure those groups are not dysfunctional.... [Sometimes] the groups are really just not working well together. And what happens is there’s one person who takes over control of the group, typically a male student. (Eric, member check interview)

He voiced a common challenge, which is that small group interactions were less equitable, in terms of unequal participation, when one student behaves more authoritatively. Every choice a teacher makes could have effects on the degree of equity in classroom interactions. Hazelle, during her member check interview, said, “It [equity] infuses all parts of your teaching, like the tasks you choose and what kind of voice are you giving?” Participants reflected that the potential for inequity or greater equity is always present in inquiry when people work together.

### *Equity in Inquiry and Inquiry for Equity*

Participants made a distinction between equity-minded inquiry and inquiry conducted to achieve equity. For example, Ziad shared,

There are two ways maybe to think about it. And I said whether there's equity in inquiry versus inquiry for equity... when we say inquiry for equity is like when we're doing this math of social justice questions.... I don't give them [students] social justice all the time. I'm doing geometry, just like number theory and something like with my students. Okay. Is that also an equity element? Of course, because that's all what I do, is how to make this more accessible. (Ziad, member check interview)

From Ziad's perspective, fostering inquiry in equity-minded ways (equity in inquiry) involved accessibility of the task, such as selecting and enacting a task that was open enough for students to begin working in ways that made sense to them. But he pointed out that some inquiry was conducted for the purpose of achieving greater equity (inquiry for equity), such as mathematics tasks that were designed to address issues of social justice. Cheryl emphasized that equity-minded inquiry is not always inquiry for equity.

I think inquiry is not equity. It can be used in service of, or it can be maybe a pathway along this journey, because I think equity is something much larger. And I think equity is also, it's an action word. I think something that's different is where people see that action as being finished. For us [inquiry group at the summer institute], we did not see that action as being finished with the completion of a mathematics problem. For us, in the context of gentrification [their topic explored in the summer institute], the action would be completed once there was something that was produced that could go beyond our classrooms to actually bring about a change, whether it was to stop gentrification, whether it was to go back in and, like I talked about, ungentrify certain communities to give certain people access that had been denied access or had their access taken away. (Cheryl, member check interview)

If equity is viewed as working toward creating social change (inquiry for equity), then inquiry could be a vehicle toward equity as an outcome. However, equity could also be viewed as creating conditions that support one another during the process of conducting inquiry, which focuses on equity in inquiry.

*Equity in inquiry: Recognize and honor strengths in collaborators.* Equity in inquiry served as a vision for how participants wanted inquiry to operate, particularly inquiring collaboratively. In equity-minded inquiry, collaborators value each person's brilliance. Participants described how they worked together during inquiry in equitable ways.

...just me being genuinely curious to learn from others, and in the group acting in such a way that I would share my ideas but also seek out others' ideas. For me, that looked like bringing genuine curiosity to gerrymandering with Fred and Antonio and colleagues, and the same for gentrification. For me, that's how it was present through the inquiry of those tasks. (Casey, initial interview)

If I'm in a committee meeting and I am the only person of color in this committee meeting full of men and I've seen that my ideas get taken up in certain ways that I didn't intend or they just straight out take my idea or they push back in certain ways, then I'm less likely to speak up because there's this inequity happening.... So I didn't feel that there [at the summer institute]. It was more like we honored each other's voices.... You know that you all are experts in some ways and that you come to the table knowing that you can learn from one another and that's what I felt. (Kaia, initial interview).

So, I definitely think, 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. (Rose, initial interview)

How we interact with one another sends messages: Do we see each other? Do we hear each other? Do we value each other? Do we appreciate each other? When we are truly open to learning from one another, we learn more, and we are stronger together (Featherstone et al., 2011).

*Equity in inquiry: Choice and flexibility.* Equity-minded inquiry can include choice such that inquirers pursue their questions and flexibility in ways that work best for them. Cheryl commented on choice and flexibility when elaborating on how she saw equity in inquiry during the summer institute.

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, whether we were inside, outside, on the floor, just having some flexibility with time. Allowing, I think even allowing us to use different methods to look up information. So just having, being able to use our laptops to find stuff. Because there were times we're on our laptops and we're on our phones, so we're just looking up stuff any way we could. (Cheryl, initial interview)

Similarly, Carmen in her initial interview said, "I think the fact that we could take our own time in discovery, I think was key." Hazelle also connected choice with an equitable experience when reflecting on her inquiry during the summer institute when she said, "My first thought is, I feel like the equity is that we got to develop our own projects. Like that it wasn't you telling us where the direction it had to go. There's something equitable about that." Seymour agreed, as he said in his first interview, "It was a problem that I had, nobody gave that to me. I posed my own problem and then I got to pursue it." He confirmed this perspective in his member check interview when he said, "Then the choice part, I think that's the most significant equity component [of the inquiry work during the summer institute]."

*Equity in inquiry: Interesting or personally meaningful inquiry.* Inquiry can be equity-minded when learners pursue a question that is personally meaningful or interesting, which can be a powerful emotional experience.

I just love that moment of math problem solving, like, I love to do mathematics... And so I got to do something that I cared about. I'm driven by my own question around mathematics. And I guess, well, I know that not everybody appreciates that the way that I do, but whatever it is that they appreciate about mathematics, I hope to provide students with the space to do those kinds of projects. So if it's about gerrymandering or if it's about the parabola, either one, you know that this is something that's meaningful and someone wants to pursue it. (Seymour, initial interview)

Nefti reflected that the opportunities to ask one's unique questions could bring more people into the field of mathematics, as he said,

My interest in [his applied mathematics subfield], like, what drew me to the field was the opportunity for me to ask my own questions. All of the other areas of mathematics, it seemed like I would have to know a lot to even make headway, where in this particular field I could ask my own questions. (Nefti, member check interview)

Arabella shared, during her initial interview, working on something that everyone in her inquiry group cared about made the inquiry a more equity-minded process. She asked, “Why do we care about this? So not just like, ‘Here’s a social justice topic that we can explore.’ But why do we care about it? Why does this matter to every single one of us?” Equity-minded inquiry, then, was inquiry that mattered to the inquirer, because not every learner has experienced mathematics that is meaningful to them. If working collaboratively, the inquiry was more equity-minded when the group decided on a line of inquiry that everyone wanted to pursue.

*Equity in inquiry: Access.* Access was expressed by some participants as another important dimension of a vision for equity-minded inquiry. Priya spoke about how she was provided greater access to opportunities to know and do mathematics, so she wanted to provide such access to her students as well.

I feel like one of the most important things to me has been this idea of access to even mathematical ideas, which people may have at that point thought that I was not even worthy of. And yet somebody opened the door to me and allowed me to kind of explore those things.... I feel like that’s one of the things that I am able to do: open doors for my students and say, ‘Well, here is some math. Let’s see if you might find this interesting.’ (Priya, member check interview)

Multiple participants spoke about teaching mathematics by enacting tasks in ways that helped students have points of entry into working on challenging tasks.

Maybe the question is something that they might find very passionate or personal and they would want to study, but by the sheer nature of them not knowing trig and trig being a requirement, it excludes them. So if you have other types of problems or if you approach the inquiry in a way that you can scale it to different levels... to still make it accessible to them at their level, but also keeping them engaged as they go through more advanced. (Antonio, member check)

The equity dimension of access was that students would have opportunities to engage in the activity of doing mathematics as a mathematician might.

I look at mathematics problems and even abstract problems like that as a playground. How do we get other students and learners of mathematics to see math as a place where you can play? Everybody’s got access to that, right.... I think I see it as a math problem as something that people with very different backgrounds could come in and contribute different things and see different things, but that being able to come in and see math as the playground, that’s a really important piece of equity. Who gets to play? (Lizzie, initial interview)

Ben shared that he hoped that he could bring students of color into mathematics by modeling his process of pursuing questions for which he did not already have answers.

Something that I care deeply about is using inquiry to make math more accessible to people, especially students of color.... But what I really try and do is humanize mathematics by kind of walking this sort of line being an expert in my field and being somebody who, oh, this is an interesting problem, but this isn’t my area of research, so I actually don’t know already what the answer is going to be. (Ben, initial interview)

Although access is a perspective on equity that is commonly recognized, it is important to acknowledge that these participants also valued access as a part of equity-minded inquiry.

*Equity in inquiry: Interdisciplinarity.* When inquiry draws from a wide range of fields, it is more equity-minded, because the integration of perspectives in new ways can challenge

current understandings. When talking about their experiences conducting inquiry in the summer institute, Katherine and Nefti discussed that incorporating interdisciplinary perspectives made their projects more equity-minded.

In exploring different questions that came up within the group, 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. And so I think when you start thinking about mathematics education as a social science, then it is inherently interdisciplinary. And so the inquiry that's happening is a combination of all of these disciplinary ways of knowing that have formed how you approach the inquiry. And so I think as we try to situate the mathematics in even the pre-K-16 curriculum within our context, the social context of doing and learning mathematics, it also is inherently a social science and interdisciplinary in the way that we're asking students to do inquiry. (Katherine, member check interview)

Katherine's group's inquiry involved mathematics, social sciences, history, and other disciplines and built on the collective efforts across these disciplines to understand gentrification. Nefti worked with Kaia and Rose to understand more about how teachers could position their students productively and give more students access to learning opportunities, and they informed their analysis by thinking about Nefti's research on behavior of ant colonies.

Me, Rose, and Kaia were playing around with this idea of how you organize classrooms to make sure that you're not excluding anyone, just talking concretely about this. There's things that you could do as a teacher, positioning yourself in the classroom, literally the place in which you stand in a classroom can influence the type of information that students are getting from you.... We were then jumping around and talking about potential connections to optimization problems that have been solved in biology, for instance, in ant colonies, in how they distribute themselves in space within the colony to optimize resource flow. Then we talked about different types of resources they might be trying to optimize, whether it's maximize or minimize the amount of time it takes for information to travel from one part of the colony to another, so that everyone is kept up to speed on what's going on, and how that relates back to the classroom. I think that it's possible that... you can ask these questions about equity and strategies to achieve it, but very naturally some of it can become tools for teaching, like really cool mathematics, and some of it even connects out into the realm of applied mathematics. (Nefti, member check interview)

Therefore, equity-minded inquiry could be thought of as a process that generates knowledge that is more robust when wider ways of knowing and knowledge bases are incorporated. Thus, interdisciplinary inquiry could have the potential to address issues of power because new approaches to learning can generate new knowledge that contrasts with what we have sociohistorically been able to learn.

*Inquiry for equity: Pursuit of socially based inquiry questions.* The intended goal or outcome of inquiry could be generating greater equity. Inquiry could lead to greater insights, which could lead to actions that create a more equitable and just world. When inquiry is conducted for equity, equity is integrated into the problem context, as students explore issues of justice within mathematical work, as explained by EmmaLee:

The purpose for me was to think about ways, when I think about inquiry and equity, I think part of what you can do is embed dimensions of equity and 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. I wasn't trying to construct equity in just an intrapersonal dimension, but how inquiry can shine lights on equity within



mathematics.... I mean, the equity for me was embedded in the context of the problem itself.  
(EmmaLee, initial interview)

Nefti agreed, as he shared in his initial interview regarding his collaborative inquiry: “The equity was forefront. And I think it was just based on the questions. The motivating question was from equity.” An inquiry question could align with a goal of working toward equity and justice.

Some participants reported that inquiry questions that addressed social issues could be more interesting or meaningful for their students. Not all mathematical activity in classroom settings is meaningful to students, and inquiry for equity could be more meaningful to them.

I was watching this lesson, and I think we would argue in math ed that it was a great lesson. Students were making sense of the volume of a cylinder, and they were using blocks, they were engaged, they were talking to each other, and it was definitely inquiry-oriented. But as I was watching the lesson, I was wondering, why do we care? Why do these students care about learning this? What does it matter? Does any of them know what to do with this knowledge? And I’m thinking, if we taught math in a different way where, I think, Kevin said yesterday, ‘Math for democracy.’ The way we bring in headlines, especially right now, and make sense of stuff that’s in our real life. Would that be more meaningful and would students know why they’re learning it?  
(Arabella, member check)

Arabella reflected on how mathematics lessons taught in ways that might be valued by the field of mathematics education could still be about mathematics that students might not care about. Instead, mathematics could be taught by investigating problems that supported working toward greater equity in our society. Priya agreed, and she suggested that inquiry for equity could be supportive for students of color.

A lot of times I’ve taught the [general education-required] math course over here, and that actually has a lot of students of color, for instance, in that. And they get quite passionate if they’re talking about things that have to do with social equity. Like when we talk about elections and the ways elections are conducted, they get quite passionate about it. So, I think we’re trying to match some of the math projects with social equity issues... that’s an important way to get those students engaged and interested. (Priya, member check)

Inquiry for equity could afford students opportunities to have a more positive connection with mathematics.

*Inquiry for equity: Supporting students through conducting inquiry.* When we conduct inquiry to support our students, it is another way we could work toward equity. They engaged in inquiry with the intention of providing their students with a similar inquiry experience around the problem they investigated at the institute.

Because one of my points in doing this was, and I keep saying this, is, like, you know, I’m always thinking about how can I bring this to my students and how can I use this as something that would be helpful to them and thinking about inquiry or equity. (Hazelle, initial interview)

Claire shared that letting the students’ curiosities drive inquiry was a way of honoring and promoting her students’ agency.

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? (Claire, member check interview)

Professors could benefit when we put ourselves in the role of students, by experiencing inquiry as they might experience it. This is an empathetic stance. We can support our students through our inquiry by learning about ideas that they would like to understand, to teach them more effectively, or to experience inquiry as they might.

### *Tensions between Inquiry and Equity*

Some participants reflected on tensions between inquiry and equity that they observed or considered. Equity-minded inquiry requires intentional support and facilitation with awareness of how equity can be fostered or inhibited. Eric strove to create equity-minded inquiry in his university classroom, but he reported that not all students had equal opportunities to participate:

Maybe that's one of the problems is I think I have an inquiry-oriented class when really I have four inquiry-oriented leaders of the class and the rest of the students are not engaging in the inquiry. Therefore, they're not having an equitable inquiry or engaging in equity. (Eric, member check)

Cheryl observed during her member check interview that intentional facilitation is needed to help students understand equity-minded inquiry, such as why we might want to offer them choice and flexibility.

There's also this tension between, on the one hand, we value this process, but I think on the other hand, we understand that if we give something that's just too open to our students, we may have some pushback because they're used to something specific that fits in this box, I'm going to do this and then I'm going to get a grade. (Cheryl, member check)

Fostering equitable inquiry, then, is an ongoing process of noticing and attending to students' perspectives, providing support, and having empathy for students' experiences.

Inquirers play important roles in navigating tensions on the way toward equitable inquiry. While working collaboratively during the institute, participants created more equitable inquiry as they worked with one another through their openness toward one another, by asking for options such as more time or particular materials, and by honoring strengths in their collaborators. Fellows were open with the facilitation team about their experiences. They shared when they experienced more and less equity during the inquiry experience, which raised awareness about the experiences that they and others were having.

There were clearly, at least among the more vocal people, really different ways in which they were constructing what the space was and what it could be used for. I felt like there were lots of tensions and discussions, discussions that needed to be had, things that were operating under the surface, and I thought that was productive. (EmmaLee, initial interview)

For instance, early in the institute, the facilitation team engaged the whole group in a mathematics inquiry question that was more abstract, outside of a socially based context. This brought up a conversation during the institute about pursuing questions that supported addressing issues of social justice or conducting inquiry for equity. Fellows provided insights that supported

the facilitation team with modifying the experience during the institute, and participants' openness about their experiences supported the facilitation team with interrogating their efforts.

Participants also offered tensions experienced when facilitating inquiry related to sharing power and authority with students. Ben shared his process of engaging in inquiry with his students.

What I really try and do is humanize mathematics by kind of walking this sort of line being an expert in my field and being somebody who, oh, this is an interesting problem but this isn't my area of research, so I actually don't know already what the answer is going to be. And I think that's, especially for somebody like me, I have to be really careful about these kind of two hats that I wear. One, the young, Black man, in an institute that is majority White. Inevitably, I sometimes get challenged about whether or not I actually deserve or earned my right to be there. I know I don't necessarily fit the stereotypical look of a math professor. And so one way to overcome that is to show them like, 'Yes, I know all this stuff. I know this stuff forward and backwards. I eat, live, breathe... all this kind of stuff, and it's great.' And then once they see like, 'Oh okay, he's actually not playing no kind of game,' that's a way to kind of earn their respect, earn their trust, and then it's a great experience. On the flip side of that, when I do my research groups, I purposely pick problems that I don't know what the final solution is going to look like. I don't know exactly where it's going to go or how it's going to shape out. But I want to give students the experience of what it's like to really be a mathematician, how to think through these problems.... I really sort of latched onto this duality between being this content expert in the classroom and then being this humble mathematician, who sees this really interesting problem, latches onto it, and then works it out like a mathematician. Trying things, some things work, some things don't. (Ben, initial interview)

Ben shared a tension between proving oneself as an expert and inviting students to author their own journeys. He also situated this narrative in the context of being a faculty member of color at a predominantly White institution.

It is possible that trying to disentangle the equity aspects from inquiry activity is not necessarily helpful. Fred articulated this perspective when he said the following during his member check interview:

It's maybe a sort of hybrid in the spaces of, it is this connecting of people in a loving way, focused on and solving injustice and making people around us better, right? And I think that's where the two come together for me. But it doesn't live in a space of just inquiry. It doesn't live in a space of just equity. (Fred, member check)

It is possible that fragmenting the equity elements apart from the inquiry activity is a disservice to the wholeness of the experience.

## Discussion

A contribution of this study is that we built upon and extended the work of Tang and colleagues (2017), which was a theoretical exploration of how inquiry-oriented mathematics teaching could support equity. Their analyses most aligned with our second theme: equity in inquiry, or how the process of conducting inquiry in mathematics could be equity-minded. Tang et al. (2017) identified aspects of the practice of inquiry-oriented mathematics teaching, such as student-generated knowledge built through collaboration with peers, and they analyzed how these practices reflected Gutiérrez's dimensions of equity. For instance, they identified how these practices could change power dynamics in the classroom when students built knowledge

together, support students' development of positive mathematical identities if they enjoy mathematics more or feel more confident, and access learning opportunities.

Both the analysis by Tang et al. (2017) and this analysis examined possibilities for how inquiry can be an equity-minded process, but our analysis revealed additional descriptions of equity-minded inquiry processes that are more targeted and additional ways that inquiry can be equity-minded. For instance, our analysis illustrated that collaboration alone would not ensure equity, but equity-minded collaboration could occur when collaborators recognize and honor strengths in one another and attend to status differences. Such collaborative practices can build positive mathematical identities, bring more collaborators' ideas into the knowledge-building process (access), and increase likelihood of power-sharing among collaborators. We also explored how interdisciplinary perspectives can enhance the nature of knowledge generated during inquiry, which was not addressed by Tang et al. (2017). Doing so connects to the power dimension of equity by challenging current knowledge bases through interdisciplinary perspectives.

A contribution of this analysis is that we described dilemmas and tensions between inquiry and equity, which were not explored by Tang and colleagues (2017). Regarding dilemmas and tensions, we recognized that equity is ever present during inquiry because actions and choices reflect cultural practices and are never politically neutral. In addition, we identified that power dynamics are always a part of interactions during inquiry, and power imbalances can occur if not intentionally addressed. It is important to be aware of pitfalls for inquiry to become less equity-minded if we are to work toward equity in inquiry.

Another contribution of this analysis is that we highlighted that inquiry can be equity-minded if its goals are directed toward greater equity; Tang and colleagues' (2017) analysis did not describe that inquiry could be conducted for equity-minded purposes. For instance, inquiry could seek answers to socially based questions that can lead to insights and actions to change the world around us (power dimension of equity). In addition, some participants conducted inquiry to support their students, which was another way of sharing power with learners and illustrated empathy toward students.

### *Contributions to Urban Mathematics Education*

This analysis of intersections between inquiry and equity contributes to research in urban mathematics education because we join those who strive toward anti-racist and anti-oppressive practices in mathematics education. By identifying dilemmas and challenges with inquiry, we hope to avoid such pitfalls and intend to promote anti-oppressive practices by identifying more equity-minded approaches to inquiry. Along with other researchers in urban mathematics education (cf., Larnell & Bullock, 2018; Larnell & Martin, 2021), we view urban spaces as places where sophisticated and authentic inquiry can and does occur, and we encourage facilitators of inquiry to see and amplify complexities and strengths in cultural practices in urban contexts.

Some of our results regarding intersections of inquiry and equity are rooted in anti-deficit perspectives: monitoring power and status dynamics to recognize and center the brilliance of every collaborator and the nature of questions pursued in inquiry. Centering the brilliance of one another is inherently anti-deficit because we strive to act on the assumptions that all collaborators have insights to offer. The nature of inquiry questions – whose questions and what questions are pursued – is potentially connected to the lives of students and colleagues. Whose questions are

worth pursuing? Some of us focused on pursuing inquiry that is relevant to our students' curiosities. What questions are pursued? Some of us focused on pursuing inquiry that is grounded in socially based issues, potentially directly connected with local activists and communities. Recognizing students' questions and community-based questions as worthy of inquiry involves developing knowledge with and building knowledge of students, which is part of political *conocimiento* (Gutiérrez, 2017).

Our methodological approach of co-researching and co-writing also contributes to research in urban mathematics education. Viewing urban mathematics education as a political project, Larnell and Martin (2021) described the value of incorporating anti-oppressive research methodologies that use alternative models for constructing knowledge. We, the first author and research participants, intentionally sought to co-construct the knowledge in this paper. In other words, we strove to enact equity in our inquiry for this paper.

### *Implications*

Our process of exploring intersections between inquiry and equity as a group of mathematics education professors and mathematics professors was a valuable one. As a group, we developed a broader set of perspectives and a more coherent and structured framework for how inquiry and equity could intertwine. The composition of the group of participants influenced what could be learned. As a group, we all strive to act on our commitment to equity through multiple forms of inquiry (inquiry-oriented teaching practices and inquiry through scholarship).

If mathematics education professors and mathematics professors are to have equity-minded collaborations to improve instruction in mathematics and mathematics education, collectively developing an understanding of intersections between inquiry and equity can be useful. Vomvoridi-Ivanovic and McLeman (2015) suggested that one way that mathematics educators can navigate challenges in their professional work toward equity was through engaging in professional learning communities or collaborating with colleagues. Following Vomvoridi-Ivanovic and McLeman (2015), we were not interested in classifying participants' ideas in a hierarchical manner. Instead, we strove to understand a multiplicity of perspectives, which can support others in anticipating these viewpoints in future dialogue and collaboration.

This framework provides perspectives to consider when seeking common ground between collaborators who want to work toward equity and pursue inquiry. Certainly it is unrealistic to expect collaborators to come to complete consensus on definitions of equity when working on inquiry. Future collaborators could examine and reflect upon this framework together for support in trying to understand a collaborator's point of view.

The collaborative effort of these participants to work together in inquiry during the summer institute and to collaborate together on understanding ways of thinking about equity as intertwined in inquiry is an illustration of potential. Mathematics education professors and mathematics professors can grow together as they collaborate. Pursuing questions of joint interest (mathematics inquiry questions, inquiry about inquiry and equity) is a way to build community and relationships. Seeking to understand one another can generate new collective knowledge. We hope that our framework can be used between other mathematics education professors and mathematics professors to understand similarities and differences between how they currently think and how they want to act as they move forward.

### *Limitations and Future Research*

A limitation of this study is that we investigated the perspectives of a relatively small number of professors. Although the number of participants was smaller compared to those in previous studies (cf., Mintos et al., 2019; Suazo et al., 2020), we investigated participants' thoughts in greater detail through multiple interviews and the co-writing method. This approach led to additional insights over previous studies. The present study also relies on self-reports, which could be viewed as limited. However, the self-reports are from professors whose professional work is aligned with commitments to equity, which offers unique perspectives on understanding how inquiry and equity are and can be intertwined.

Future research can investigate what inquiry looks like – the similarities and differences – when participants try to understand one another's perspectives. No one participant reported every single viewpoint in this framework. Each participant reported at least one of the components of the framework. Do participants with different perspectives on how inquiry and equity intertwine engage differently in inquiry when they investigate their unique questions or do they facilitate inquiry-oriented instruction differently?

### *Conclusions*

Our framework of how inquiry and equity intertwine offers structure and insight to discussions of conceptions of equity in mathematics education (e.g., Gutiérrez, 2012; Mintos et al., 2019; Suazo-Flores et al., 2020) and approaches to conducting inquiry-oriented instruction (e.g., Tang et al., 2017). We hope that this framework raises awareness of how equity can be seen as ever-present during inquiry. The distinction between equity in inquiry and inquiry for equity also offers insight. Part of developing political *conocimiento* (Gutiérrez, 2017) is to broaden and challenge current knowledge. We made an effort to do this through extending the work of Tang and colleagues (2017). Developing political *conocimiento* also involves learning to notice and entertain multiple interpretations. We engaged in doing so when we built our collective framework for intersections between inquiry and equity. It is our hope that our process of learning to understand these multiple viewpoints can support future collaborative efforts between mathematics professors and mathematics education professors as we work toward shared goals of fostering a more equitable and just society.

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### **References**

- Aguirre, J., Mayfield-Ingram, K., & Martin, D. (2013). *The impact of identity in K–8 mathematics learning and teaching: Rethinking equity-based practices*. National Council of Teachers of Mathematics.
- Association of Mathematics Teacher Educators (2015). *Equity in mathematics teacher education: A position paper of the Association of Mathematics Teacher Educators*.  
[https://amte.net/sites/default/files/amte\\_equitypositionstatement\\_sept2015.pdf](https://amte.net/sites/default/files/amte_equitypositionstatement_sept2015.pdf)
- Boaler, J., & Greeno, J. G. (2000). Identity, agency, and knowing in mathematical worlds. In J. Boaler (Ed.), *Multiple perspectives on mathematics teaching and learning* (pp. 45–82). Ablex.

- Brown, S. I., & Walter, M. I. (2005). *The art of problem posing*. Psychology Press.
- Bryant, S., Eubanks-Turner, C., Moore, C., Reznikoff, S., & Yu, J. (2018) Equity in mathematics education: Five mathematicians reflect on the 2018 PCMI workshop. *MAA Focus*, 38(6), 16–18.  
<http://digitaleditions.walsworthprintgroup.com/publication/?m=7656&i=546728&p=18>
- Cerezo, N. (2004). Problem-based learning in the middle school: A research case study of the perceptions of at-risk females. *RMLE Online*, 27(1), 1-13.
- de Freitas, E., & Sinclair, N. (2020). Measurement as relational, intensive and analogical: Towards a minor mathematics. *The Journal of Mathematical Behavior*, 59, 100796
- Featherstone, H., Crespo, S., Jilk, L. M., Oslund, J. A., Parks, A. N., and Wood, M. B. (2011). *Smarter together! Collaboration and equity in the elementary math classroom*. National Council of Teachers of Mathematics.
- Felton-Koestler, M. D. (2020). Teaching sociopolitical issues in mathematics teacher preparation: What do mathematics teacher educators need to know? *The Mathematics Enthusiast*, 17(2), 435–468.
- Foote, M. Q., & Bartell, T. G. (2011). Pathways to equity in mathematics education: How life experiences impact researcher positionality. *Educational Studies in Mathematics*, 78(1), 45–68.
- Freudenthal, H. (1973). *Mathematics as an educational task*. Reidel.
- Goldin, G. A. (1990). Chapter 3: Epistemology, constructivism, and discovery learning in mathematics. In *Journal for research in mathematics education. Monograph, Vol. 4, constructivist views on the teaching and learning of mathematics* (pp. 31–47, 195–210).
- Gonick, M., & Hladki, J. (2005). Who are the participants? Rethinking representational practices and writing with heterotopic possibility in qualitative inquiry. *International Journal of Qualitative Studies in Education*, 18(3), 285–304.
- Gravemeijer, K., Cobb, P., Bowers, J., & Whitenack, J. (2000). Symbolizing, modeling, and instructional design. In P. Cobb, E. Yackel, & K. McClain (Eds.), *Symbolizing and communicating in mathematics classrooms: Perspectives on discourse, tools, and instructional design* (pp. 225–273). Erlbaum.
- Gutstein, E. (2003). Teaching and learning mathematics for social justice in an urban, Latino school. *Journal for Research in Mathematics Education*, 34(1), 37–73.
- Gutstein, E., Fey, J. T., Heid, M. K., DeLoach-Johnson, I., Middleton, J. A., Larson, M., Dougherty, B., & Tunis, H. (2005). Equity in school mathematics education: How can research contribute?: NCTM Research Committee. *Journal for Research in Mathematics Education*, 36(2), 92–100.
- Gutiérrez, R. (2002). Enabling the practice of mathematics teachers in context: Toward a new equity research agenda. *Mathematical Thinking and Learning*, 4(2-3), 145-187.
- Gutiérrez, R. (2008). Research commentary: A gap-gazing fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education*, 39(4), 357–364.
- Gutiérrez, R. (2012). Context matters: How should we conceptualize equity in mathematics education? In B. Herbel-Eisenmann, J. Choppin, D. Wager, & D. Pimm (Eds.), *Equity in discourse for mathematics education* (pp. 17–33). Springer.
- Gutiérrez, R. (2013). Why (urban) mathematics teachers need political knowledge. *Journal of Urban Mathematics Education*, 6(2), 7–19.
- Gutiérrez, R. (2017). Political conocimiento for teaching mathematics: Why teachers need it and how to develop it. In Kastberg, S. E., Tyminski, A. M., Lischka, A. E., & Sanchez, W. B. (Eds.), *Building support for scholarly practice in mathematics methods* (pp. 11–37). Information Age.
- Harding, N. A. (2020). Co-constructing feminist research: Ensuring meaningful participation while researching the experiences of criminalised women. *Methodological Innovations*, 13(2).
- Heron, J. (1996). *Co-operative inquiry: Research into the human condition*. Sage.
- Jansen, A., & Center for Inquiry and Equity in Mathematics. (2021). Entangling and disentangling inquiry and equity: Voices of mathematics education and mathematics professors. In D. Olanoff, K. Johnson, & S. M. Spitzer (Eds). *Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (p. 222).
- Johnson, E., Andrews-Larson, C., Keene, K., Melhuish, K., Keller, R., & Fortune, N. (2020). Inquiry and gender inequity in the undergraduate mathematics classroom. *Journal for Research in Mathematics Education*, 51(4), 504–516.
- Kuster, G., Johnson, E., Keene, K., & Andrews-Larson, C. (2018) Inquiry-oriented instruction: A conceptualization of the instructional principles, *PRIMUS*, 28(1), 13–30
- Lampert, M. (1990). When the problem is not the question and the solution is not the answer: Mathematical knowing and teaching. *American Educational Research Journal*, 27(1), 29–63.

- Larnell, G. V., & Bullock, E. C. (2018). A socio-spatial framework for urban mathematics education: Considering equity, social justice, and the spatial turn. In T. G. Bartell (Ed.), *Toward equity and social justice in mathematics education* (pp. 43–57). Springer.
- Larnell, G. V., & Martin, D. B. (2021). Urban mathematics education as a political and personal project. In *Handbook of urban education* (2nd ed., pp. 355–368). Routledge.
- Lieblich, A., Tuval-Mashiach, R., & Zilber, T. (1998). *Narrative research: Reading, analysis, and interpretation* (Vol. 47). Sage.
- Lubienski, S. T. (2000). Problem solving as a means toward mathematics for all: An exploratory look through a class lens. *Journal for Research in Mathematics Education*, 31(4), 454–482.
- Manning, S. M. (2018). Collaborative poetic processes: Methodological reflections on co-writing with participants. *The Qualitative Report*, 23(4), 742–757.
- Martin, D. B. (2006). Mathematics learning and participation as racialized forms of experience: African American parents speak on the struggle for mathematics literacy. *Mathematical Thinking and Learning*, 8(3), 197–229.
- Martin, D. B., Gholson, M. L., & Leonard, J. (2010). Mathematics as gatekeeper: Power and privilege in the production of knowledge. *Journal of Urban Mathematics Education*, 3(2), 12–24.
- McLeman, L., & Vomvoridi-Ivanovic, E. (2012). Understanding the practices of mathematics teacher educators who focus on issues of equity. *REDIMAT: Journal of Research in Mathematics Education*, 1(3), 278–300.
- Melville, W., Bartley, A., & Fazio, X. (2013). Scaffolding the inquiry continuum and the constitution of identity. *International Journal of Science and Mathematics Education*, 11(5), 1255–1273.
- Mintos, A., Hoffman, A. J., Kersey, E., Newton, J., & Smith, D. (2019). Learning about issues of equity in secondary mathematics teacher education programs. *Journal of Mathematics Teacher Education*, 22(5), 433–458.
- Mueller, M. F., & Maher, C. A. (2010). Promoting equity through reasoning. *Teaching Children Mathematics*, 16(9), 540–547.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*.
- Polkinghorne, D. E. (1995). Narrative configuration in qualitative analysis. *International Journal of Qualitative Studies in Education*, 8(1), 5–23.
- Popkewitz, T. (2004). The alchemy of the mathematics curriculum: Inscriptions and the fabrication of the child. *American Educational Research Journal*, 41(1), 3–34.
- Rasmussen, C., & Kwon, O. K. (2007). An inquiry-oriented approach to undergraduate mathematics. *The Journal of Mathematical Behavior*, 26(3), 189–194.
- Reinholz, D., Johnson, E., Andrews-Larson, C., Stone-Johnstone, A., Smith, J., Mullins, B., Fortune, N., Keene, K., & Shah, N. (2022). When active learning is inequitable: Women’s participation predicts gender inequities in mathematical performance. *Journal for Research in Mathematics Education*, 53(3), 204–226.
- Roh, K. H. (2003). *Problem-based learning in mathematics*. ERIC Clearinghouse.
- Rubel, L. H. (2017). Equity-directed instructional practices: Beyond the dominant perspective. *Journal of Urban Mathematics Education*, 10(2).
- Schreier, M. (2012). *Qualitative content analysis in practice*. Sage.
- Shah, N., Cosby, M. D., Goffney, I. M., Kalenic-Craig, C., Wood, M. B., Hand, V., & Crespo, S. (2022). “Bossy,” “boy,” and “urban”: Troubling coded language in mathematics education research. In J.M. Langer-Osuna & N. Shah (Eds.), *Making visible the invisible: The promise and challenges of identity research in mathematics education*. National Council of Teachers of Mathematics.
- Short, M. (2018). The co-operative inquiry research method: A personal story. In M. Pawar, W. Bowles, & K. Bell (Eds.), *Social work: Innovations and insights* (pp. 232–244). Australian Scholarly.
- Short, M., & Healy, J. P. (2016). Writing ‘with’ not ‘about’: Examples in co-operative inquiry. In S. Gair & A. V. Luyn (Eds.), *Sharing qualitative research: Showing lived experience and community narratives* (pp. 188–203). Routledge.
- Silver, E. A. (1994). On mathematical problem posing. *For the Learning of Mathematics*, 14(1), 19–28.
- Siry, C. A., & Zawatski, E. (2011) ‘Working with’ as a methodological stance: Collaborating with students in teaching, writing, and research, *International Journal of Qualitative Studies in Education*, 24(3), 343–361.
- Staples, M. (2007). Supporting whole-class collaborative inquiry in a secondary mathematics classroom. *Cognition and Instruction*, 25(2–3), 161–217.
- Suazo-Flores, E., Stoehr, K., & Fernandes, A. (2020, winter). Mathematics teacher educators’ conceptualizations of equity. *Connections*. <https://amte.net/connections/2020/11/mathematics-teacher-educators%E2%80%99-conceptualizations-equity>



- Tang, G., El Turkey, H., Cilli-Turner, E., Savic, M., Karakok, G., & Plaxco, D. (2017). Inquiry as an entry point to equity in the classroom. *International Journal of Mathematical Education in Science and Technology*, 48(Suppl. 1), S4–S15.
- Vomvoridi-Ivanovic, E., & McLeman, L. (2015). Mathematics teacher educators focusing on equity: Potential challenges and resolutions. *Teacher Education Quarterly*, 42(4), 83–100.

**Table 1*****Framework: Intersections between Inquiry and Equity***

Categories of intersections between inquiry and equity	Examples of intersections between inquiry and equity
Equity possibilities and dilemmas are always present during inquiry.	<ul style="list-style-type: none"> <li>• Structural: Inquiry is not politically neutral. It is culturally situated, racialized, and genderized. It reflects values and choices about whose mathematics is practiced.</li> <li>• Interpersonal: Power dynamics and status dynamics are always a part of interactions during inquiry.</li> </ul>
Equity in inquiry: Visions for how collaborative inquiry can operate, as a process, to be more equity-minded	<ul style="list-style-type: none"> <li>• Recognizing and honoring the strengths of one another in ways that attend to status differences</li> <li>• Offering choice and flexibility in the inquiry question selection and inquiry process</li> <li>• Engaging in personally meaningful inquiry</li> <li>• Accessing mathematics content or practices</li> <li>• Engaging in interdisciplinary inquiry</li> </ul>
Inquiry for equity: Inquiry conducted toward an outcome of achieving greater equity	<ul style="list-style-type: none"> <li>• Engaging in socially based inquiry questions</li> <li>• Supporting one's students through conducting inquiry</li> </ul>

### Appendix A: Timeline for Study

Date	Implementation Steps
Fall 2018	Participant recruitment & selection
August 2019	Week-long summer institute
September & October 2019	Design of interview protocol with institute facilitation team
November & December 2019	Initial interviews with each institute participant conducted by facilitation team via Zoom
Spring 2020	Initial interviews analyzed by facilitation team
Summer 2020	Member check interviews with each institute participant conducted by first author via Zoom
August, September, & October 2020	Co-interpretation and co-writing meetings, facilitated by first author. First author applied ideas from meetings to improve analysis and writing between meetings and shared progress at next meeting.
December 2020 & January 2021	Research texts shared with each participant (about their perspective on intersections between inquiry and equity) for feedback
Spring 2021	Initial paper draft generated by first author
March 2021	Co-writing meeting to revisit and co-construct authorship principles and practices and decide upon journal outlet
April 2021	Co-writing meeting to discuss and create processes for providing feedback on paper draft
Summer & early fall 2021	Multiple opportunities provided for participants to provide asynchronous feedback on versions of the drafted paper
January 2022	First draft submitted to <i>JUME</i>
May 2022	Reviews received and shared with participants
June & July 2022	Co-writing meetings to discuss revising the paper
August 2022	Revision draft distributed to participants for asynchronous feedback. Revision revised based on the feedback and submitted to <i>JUME</i> .

April 2023

Draft with minor revisions distributed to participants for asynchronous feedback. Incorporated comments, revised, and submitted to *JUME*.

## Appendix B: Interview Protocols

### Initial Interview Questions

*\*Focal questions from initial interview that were targeted for analysis*

Framing to share with participant: For the purpose of understanding how the institute unfolded for participants, we have some questions for you about your experience that week.

Materials needed: Application for the institute [*The questions on the application included: Why is attending important to you? What do you hope to learn and contribute to the community? How will your students benefit from your participation as a fellow?*]

Questions for interviewee:

1. Looking back on the institute in August, what stands out for you about what happened during that week?
2. What did you hope to get out of this week-long institute? In what ways did you have an opportunity to work on this?
3. Considering the experiences you had during the institute, which ones stand out as being valuable to you? Why were they valuable to you?
4. *\*In what ways, if at all, did your participation at the institute affect your thinking about inquiry or equity or both?*
5. What else would you like to share about your participation in the institute?

Framing to share with participant: Throughout our week together, there appeared to be consensus that issues of equity can be or must be directly integrated with engaging in mathematical inquiry. To situate thinking about relationships between equity and inquiry, we would like to think with you by going back to your inquiry project experience during the institute.

Materials needed: Pictures of participant's inquiry project work from the summer institute.

6. *\*So, let's look back on the inquiry project that you conducted during the institute. Here are pictures that we have from your inquiry activity [share screen]. Could you tell me the story about your inquiry project experience? What happened? What did you learn?*
  - a. Looking back on how you began your inquiry project, what did you initially want to investigate? What was the purpose of this project for you?
  - b. How did the project change as you worked on it? What did you give up from making changes? What did you gain from making changes?
  - c. Who did you collaborate with and how did this collaboration come to take place?
  - d. What did you learn through this collaboration? - Consider if any of the collaborative interactions were valuable: What ways did you find value in the collaborative interactions you had?
7. *\*In the field, individuals are often asked, "Where's the math?" when we talk about mathematical inquiry experiences. As a community, how might we play a role in changing the conversation to "where's the equity?" So, if you were to consider where equity was in your *inquiry project experience*, what would you say?*

8. In what ways did your inquiry project affect your professional work beyond the institute, if at all?

Framing: Now we would like to ask you some additional questions about how you are thinking about your professional work in the upcoming year.

9. In what ways, if at all, are you engaging in your work or thinking as a mathematics educator differently after spending time with colleagues at the institute? What interactions supported you to do this?
10. One aspect of the evaluation follow-up is to understand any collaborative interactions that occur among fellows and between fellows and mathematicians, if any occur. At this point, do you have plans/what are your plans for collaborating moving forward? Would this take place in the fall or spring or both? With whom? What is the work?
11. What sort of collaborations do you wish would develop with institute participants that haven't developed yet?
12. As you consider future online interactions with each other in this group, what might be some content/interactions that would be useful in supporting your needs/professional growth?

Concluding question: Part of this interview was for project evaluation purposes. Part of the interview was for research purposes. Questions about the intersection of equity and inquiry were for research. Would you be interested in being a part of analyzing and writing about this topic with us?

### **Member Check Interview Questions**

(Note: These questions and excerpts from their initial interview were sent to participants prior to the member check interview.)

1. What does this interview excerpt represent to you regarding a way that inquiry and equity could intersect, if at all?
2. What more would you like to share to help others understand your perspective on how inquiry and equity could intersect?
3. If someone wanted to read more to understand ideas to understand your perspective on the intersection of inquiry and equity, what would you recommend?