SUPPORTING BEGINNING TEACHERS TO ENGAGE IN RELATIONAL INVESTIGATIONS OF TEACHING AND LEARNING

Mallika Scott
California State University, Fullerton
malscott@fullerton.edu

This paper examines a social design-based approach to supporting beginning elementary school teachers toward ambitious and equitable mathematics teaching. First-year teachers were enlisted as co-designers of a learning community aimed at supporting participants to build classroom math communities that leverage students' diverse mathematical resources. Findings show that teachers collectively moved from thinking about teaching as fixing local problems to engaging in relational investigations of teaching and learning that centered students' mathematical experiences. This shift supported teachers to take up and make progress toward complex problems of practice in their classroom teaching. This study has implications for how we conceptualize, analyze, and design for equity-oriented learning for beginning teachers.

Keywords: Mathematics education, Instructional Vision, Equity and Diversity

> "I just feel like I have this huge moral dilemma. The math benchmarks are coming up and I have to cover all these things…it's just weighing on me. And there have been a couple periods where I haven't been the math teacher I want to be."
> Kara, Elementary School teacher, October 2016

Kara, a recent graduate of a highly-regarded teacher preparation program, is not alone in facing the moral dilemma of being committed to a vision of teaching that does not yet exist in schools on any wide scale. Schools in the US tend to be organized to sort students by various measures of "achievement" (standardized tests, "math benchmarks" etc.), searching out what students do not know rather than building on the reasoning evident in what students *are* doing (McDermott & Raley, 2011). This fixation on sorting produces winners and losers in ways that intersect with social hierarchies and inequities, resulting in students from some nondominant communities continuing to be constructed as "struggling" or "failing" (Martin, 2003, 2009). Given the high status of mathematics in the US and the ways mathematics achievement is often conflated with intelligence, math classrooms can be fertile ground for perpetuating the inequities endemic in systems of schooling preoccupied with finding deficits (Martin, 2009; Shah, 2017).

Scholarship on equity and mathematics teaching has helped to paint a picture of alternative classroom arrangements that can support robust learning for all students. In these classrooms, students are supported to make sense of complex ideas and to recognize and learn from the diverse strengths each student brings to mathematics (Boaler, 2008; Cohen, Lotan, Scarloss, & Arellano, 1999). Kara shares with other members of her cohort a deep commitment to this vision of ambitious, equity-oriented math teaching. Yet the pressure of having to give her 3rd grade students a "math benchmark" assessment led Kara to sometimes focus more on whether students were producing correct answers on pages of multiplication problems than on noticing and building on the diverse ways they were making sense of multiplication.

It is often assumed that a reasonable goal for new teachers like Kara is to "survive" their first year, not to take up an ambitious agenda. In line with this assumption, the support offered to

Otten, S., Candela, A. G., de Araujo, Z., Haines, C., & Munter, C. (2019). *Proceedings of the forty-first annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. St Louis, MO: University of Missouri.

beginning teachers tends to be geared toward generic teaching topics (Ingersoll & Strong, 2011; Mehta, Theisen-Homer, Braslow, & Lopatin, 2015). New teachers are often left entirely on their own to figure out how to navigate the "huge moral dilemmas" that arise when they attempt to counter the culture of deficit that dominates systems of schooling, leading some teachers to either give up on their commitments or to give up on teaching (DeAngelis, Wall, & Che, 2013).

This paper reports on the learning that can become possible when support for new teachers is intentionally designed to provide opportunities to take on the challenges of equity-oriented mathematics teaching in a community oriented toward a shared vision. Specifically, I investigate how a learning community, named Math Crew by participants (of which Kara was a member and I was facilitator), supported first year teachers to engage in relational investigations of teaching and learning that centered students' mathematical experiences.

Theoretical Perspectives and Prior Research

In this section I describe the vision for mathematics classrooms that formed the foundation of Math Crew. I then explain the ways that research on social design and teacher learning informed the design of this teacher learning community.

Ambitious and Equitable Mathematics Teaching

Math Crew was formed to support teachers to create classroom math communities that are both ambitious and equitable. I join other scholars in using the term "ambitious" to refer to math teaching that provides students with opportunities to engage in cognitively demanding math tasks and considers the ways students make sense of these tasks to be central to instruction (Jackson & Cobb, 2010; Kazemi, Franke, & Lampert, 2009). Further, I use the phrase "ambitious and equitable" mathematics teaching to point to a particular conception of equity underlying the shared vision held by Math Crew participants. In line with scholarship that interrogates the ways that our educational system continues to perpetuate disparate outcomes for different populations of students, I consider equity in mathematics teaching to mean not merely improving access to learning opportunities for all students, but also disrupting dominant hierarchies of power and privilege (R. Gutiérrez, 2008, 2013; Gutstein, 2003; Leonard & Martin, 2013; Martin, 2003). The vision underlying the Math Crew community is one that considers ambitious and equitable mathematics teaching to entail working toward a more just educational system where students from nondominant communities are assumed to have rich and diverse mathematical resources that benefit everyone's mathematical learning.

A Social Design Approach to Teacher Learning

Organizing classrooms to build on diverse mathematical strengths runs counter to the common discourse and practices of math schooling. Design responses to this challenge must therefore provide teachers with robust support that honors the complexity and dilemmas inherent in this work. Social design-based research approaches focus on designing activity systems that consider the tensions and contradictions participants encounter in their work to be resources for learning, rather than obstacles to be overcome (Engeström, 2011; Gutiérrez & Jurow, 2016; Gutiérrez & Vossoughi, 2010). In these approaches to design, participants are actively involved in co-constructing the supports they need to navigate the tensions they encounter (Gutiérrez & Jurow, 2016). By focusing on systems rather than individuals, social design-based research attends to the ways different aspects of design, such as the tools and artifacts provided and the participant structures used, work together to mediate learning toward a shared goal. Drawing on these principles, Math Crew was co-designed with participants to support teachers to navigate

the tensions of attempting to enact ambitious and equitable math teaching while working in contexts where that vision was not widely shared.

In taking the activity system as the unit of analysis, I conceptualize teacher learning as changes in participation in teaching activities over time (Rogoff, 1994). I consider "teaching" to include classroom teaching with students as well as the planning, reasoning, and reflection that shape what happens in classrooms. For the design of Math Crew routines and my analysis of learning over time, I draw on in-depth studies of teacher learning communities that have identified generative activities for learning. These studies have found that conversational routines (e.g. replays and rehearsals of actual teaching) that support teachers to make connections between teaching choices and underlying principles of ambitious teaching can be productive sites for teacher learning and for analyzing changes in teachers' participation (Horn, 2005; Horn & Little, 2010). This line of research has also highlighted the importance of interactional norms that govern teacher activities, by noting, for example, the extent to which discussions function to either open investigation into "problems of practice" or close conversations to further analysis (Horn & Little, 2010; Little, 2002). Drawing on this research, the intention of the design of Math Crew was to create a space that invited deep collective investigations of problems of practice and supported participants to make connections to their shared vision of teaching.

In this paper, I analyze teacher learning in Math Crew by examining changes in participation over time. I find that participants moved from approaching teaching by trying to fix local problems to engaging in relational investigations of teaching and learning that centered students' mathematical experience as it connected to different aspects of the classroom learning ecology. As participants shifted to investigating from this relational perspective, they took up complex problems of practice in their classroom and worked on them over time in ways that were consequential for their students. Their learning coevolved across the Math Crew activity system and their classroom activity systems, with the travel across systems providing new resources for learning toward ambitious and equitable mathematics teaching.

Methods

This study grew out of my experience teaching prospective elementary teachers in a math methods course at a large public university. During their preparation, many of these teacher candidates developed a deep commitment to organizing their classrooms to build on students' diverse mathematical strengths. At the same time, they were daunted by the realities of working toward a vision for math classrooms that differed substantially from the focus on finding and fixing deficits present in many schools. With the aim of learning more about how to support beginning teachers toward ambitious and equitable math teaching, I invited six of these teachers to join me in creating a teacher learning community to provide support during the first year of teaching. These teachers were selected because they had each expressed commitment to equity-oriented math teaching during the methods course and would be teaching in local K-5 classrooms during the 2016-2017 school year. All six enthusiastically accepted, and Math Crew was created.

Table 1: Participants, Schools, Districts (all pseudonyms)

Teacher	Grade	School	School District
Selina	1st grade	Connections Community School	Hamilton Unified School District (HUSD)
Marie	1st grade	Rise Up Charter School	Charter School in Hamilton

Kara	3rd grade	Connections Community School	Hamilton Unified School District (HUSD)
Maritza	4th grade	Glenshire Elementary School	Logan Unified School District (LUSD)
Tina	5th grade	Cleveland Elementary School	Sullivan Unified School District (SUSD)
Lauren	5th grade	Taylor Elementary School	Hamilton Unified School District (HUSD)
Facilitator: Author			

Math Crew Design

The design of Math Crew was grounded in two structures: monthly learning community meetings and classroom visits (4-6 over the course of the year) by me as group facilitator. Underlying both structures was a set of design principles drawing from literature on social design and teacher learning communities: 1) Participants must be actively involved in design decisions, 2) Tools, artifacts, routines, and participation structures should be oriented toward student and teacher strengths rather than deficits, 3) Conversational routines and participation structures should support collective investigation of problems of practice.

As participants were actively involved in shaping and reshaping Math Crew, monthly meetings and classroom visits were responsive to the needs of the community. Different routines developed over the course of the year, including sharing success stories and dilemmas from the classroom, doing math together to support our thinking about specific content, choosing focal students and discussing questions about these students, and looking for strengths in student work and discussing how to build on them. During the first two Math Crew meetings, we worked together to formulate our shared vision for ambitious and equitable math teaching. Out of these discussions, the group articulated their shared commitment as "building a classroom community where every student meaningfully contributes to the mathematical work of the classroom."

Data Collection

Primary data sources include monthly two-hour, video-recorded community meetings, ethnographic field notes from classroom visits, audio-recordings of a focus group interview mid-way through data collection, and audio-recordings of individual closing interviews with each participant. For the purposes of this paper, video-recordings of Math Crew meetings serve as the primary data source, with field notes serving as a supporting data source.

Analytic Methods

To reduce the data, I created activity logs for the nine Math Crew meetings, breaking them into 8-10 minutes episodes and writing a summary of the activity with observer comments. During this process, the routine of starting each meeting with one participant sharing a teaching story about their classroom math community (suggested by a participant at our first meeting) emerged as an activity to investigate for changes in participation over time. This routine happened at six of the nine meetings and followed the same protocol. I created more detailed activity logs for these stories, chunking them in 3 to 5 minute episodes and writing detailed notes about the content of the episode and observer comments about emerging patterns. These conversations were transcribed and coded using an open coding process to capture teacher participation. I worked with a research assistant to begin to group codes and to identify patterns in the ways conversations evolved over time. Through this process we decided on a subset of

codes that best captured the changes we were seeing in the video-recordings. This analysis revealed two phases of activity marked by substantial differences in participation. The table below shows our condensed coding scheme.

Table 2: Coding Scheme to Capture Change Over Time

Code	Description	Example
Sharing students' mathematical actions	Describing mathematical participation of students	"He was able to, you know, interpret his own data and then come up with a question which is really hard and then answer his own question."
Connecting learning ecology with math participation	Relating how students are participating to an aspect of the classroom learning ecology	"It reminds me of Kara's story about Ahmed, like having different content kind of opening up different kinds of opportunities for kids."
Connecting to ambitious and equitable math teaching	Relating a teaching action to their shared commitment	"At the end of the day the kids are out of my room, I can take a breath and then I can actually look at their work and look at what they are doing and notice their strengths"

Findings

Over the course of the school year, participants brought different teaching stories to discuss in Math Crew as they tried to enact their commitment to ambitious and equitable math teaching. Analysis of the activity of making sense of teaching stories over the course of the school year revealed two phases of the activity: Phase 1 in which teaching was minimally investigated, where relatively simple solutions were offered to complex teaching issues with little connection to a broader vision for teaching, and Phase 2 in which Math Crew teachers began to investigate students' mathematical experiences as part of a complex classroom learning ecology. As teachers engaged in these relational investigations of teaching and learning, they increasingly connected their choices in the classroom, what they saw students doing in response to these choices, and their shared commitment to creating ambitious and equitable classroom math communities.

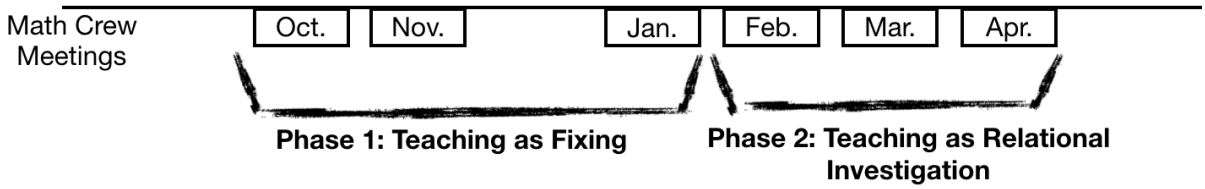

Figure 1: Change Over Time in Math Crew

During Phase 1, when teachers engaged in the routine of sharing a teaching story, both the telling of the story and the conversation that followed focused on relatively simple ideas or solutions. Teachers tended to talk mainly about the perspective of the teacher and to minimally investigate the reasons students may be acting in particular ways or to connect their actions to aspects of the classroom learning ecology. During Phase 2, stories or issues were still sometimes initially framed from the teacher perspective, but subsequent discussions of the classroom began to include investigating students' mathematical experiences and making connections between student actions and the classroom learning ecology. These discussions touched on many larger themes of teaching related to the Math Crew shared commitment to ambitious and equitable

math teaching and often led the group to consider complex problems of practice such as how to support students to see value in each other's mathematical contributions or how to support students to recognize many different ways to be good at mathematics.

To provide a more detailed look at the changes in these conversations over time, I examined the ways teachers participated in these conversations, analyzing how teachers talked about mathematical participation and the connections they made to the learning ecology and to their shared vision. Table 3 shows the frequency and nature of these discursive practices during the story telling routine.

Table 3: Discursive Practices over Time

	Phase 1			Phase 2		
	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.
Sharing students' mathematical actions	1	3	1	6	5	6
Connecting learning ecology with math participation	0	2	0	1	5	10
Connecting to ambitious and equitable math teaching	0	0	1	7	9	11

As is evident in the table above, during the first three Math Crew meetings, discussions of teaching stories were not well connected to students' mathematical actions, to how their actions related to the classroom learning ecology, or to their shared commitment to ambitious and equitable math teaching. The conversations during phase 2 included many more instances of connecting to the specifics of what students were doing in the classroom as well as connecting to themes and questions related to the Math Crew shared commitment of building a math community where every student meaningfully contributes to the mathematical work of the classroom. These discussions led to different articulations of teaching issues. Whereas in early meetings issues tended to remain local problems related to a particular classroom or lesson or to particular students, in later meetings even if issues were initially framed in local terms, participants made connections to larger problems of practice related to the shared vision of Math Crew and considered the issues from the perspective of how they might shift aspects of the classroom learning ecology.

Phase 1: Teaching as Fixing Local Problems

An example of this early form of discussing teaching stories where complexity was left relatively unexplored, occurred in the October Math Crew meeting when Tina shared a story from her 5th grade math classroom. She described a moment when a student shared an incorrect answer to a division problem, commenting, "another student turned around and said, 'WHAT?!?' And so right there and then I was like 'okay we need to refocus, this is not the way we talk to each other in math.'" Tina continued, "I had to remind myself just cuz I tell my students once, they are not going to immediately change their mindset and be able to be the kindest and nicest people in the world." In Tina's telling of this story, she described the issue as students not being kind to each other, with no exploration of why students might be responding critically to incorrect answers. Kara responded, "it kind of takes on this icky feeling of kids like really being critical of each other's thinking…And I really get on them for that, but I feel like there hasn't

been a full change of attitude." Here, Kara continued with Tina's description of the issue as students being critical and then described her insufficient attempts to solve that problem.

The conversation lasted for nine minutes and the teaching responses generated were to "keep repeating yourself" because it takes time and to "write out our norms" so that everyone has an explicit visual reminder. These ideas are sensible, but they are limited and these limitations are directly related to how teachers made sense of Tina's story. The conversation focused on the perspective of the teachers, with the issue being understood as getting students to be kinder to each other. If the issue had been investigated in more depth and teachers had considered possible reasons *why* students might be responding negatively to incorrect answers such as students not seeing what they can learn from incorrect answers or not seeing value in each other's ideas (as were discussed in later Math Crew meetings), very different sorts of conversations about teaching could have been possible. These conversations might have made space for teachers to consider issues of status or of narrow cultural notions of what math is, which may have led to inquiry and teaching ideas more responsive to the complexity of the issue.

Phase 2: Teaching as Relational Investigation

During the February Math Crew Meeting, Tina brought a different story to the group that led to relational investigation and the identification of a complex problem of practice. Tina explained to the group that one of her students, Albert, had asked her if the reason they did math at the end of the day was because it wasn't important. She then decided to have her students respond to the writing prompt, "Do you think math is important? When do we use math outside of math class?" Albert was the only student who wrote that he didn't think math was important. She read his response to the group, and then commented, "so I have the question now of how I can continue to show the class that I do value math and that it is very useful…a lot of it has to do with growth mindset too with this particular student, if he's willing to open himself up to liking math." In Tina's initial description of the issue, she described it as a relatively simple issue of showing her students that "I do value math" and of Albert being "willing to open himself up."

In the 15-minute conversation that followed, participants investigated Tina's initial framing to consider possible reasons why Albert might not yet name math as important. Lauren commented, "What stood out to me was that the one reason he gave for being good at math was because he wanted to be smart which means he associates being good at math with being smart. And since he doesn't associate himself with math then he doesn't think he's smart." Maritza added, "Yeah, I kinda thought that he only associates math with calculations. He seems to think calculating numbers is boring so therefore, math is boring." Marie picked up on the theme of math and smartness, adding "what's so sad is that sometimes they are not the ones that told themselves they are dumb… just like recognizing that it is a bigger issue that we have in our culture about math and the value of it…It's just like a symptom of a larger problem." Here Marie pushed on what Tina offered as an issue of showing that she valued math and Albert being "willing" to like math by suggesting that Albert's writing could be understood as sensible given pervasive cultural narratives about what mathematics is and what it means to be good at it. The conversation then turned to how teachers might support their students to see math as a broader more inclusive space that is not just about calculation and how they might support individual students like Albert to be recognized as competent within that broad space. This problem of practice of upending cultural notions of what math is and what it means to be good at it is a much more generative space for equity-oriented teacher learning than the local problem of Tina needing to show she values math or of Albert needing to be willing to like math.

Summary of Shift to Relational Investigation

In Phase 1 of the activity of making sense of teaching in Math Crew, classroom stories were shared and discussed in ways that offered some new teaching ideas. These conversations provided teachers with space to make sense of teaching together and offered new resources for classroom teaching such as posting norms and giving students new ways to respond to each others' thinking. In Phase 2, as teachers dug deeper into teaching stories from a relational perspective that centered students' mathematical experiences, they participated in ways that created many more opportunities for equity-oriented learning. Lauren and Maritza analyzed the specifics of what Albert was saying and then connected his writing to broader issues of teaching and learning. Marie connected Albert's perceptions about himself and about mathematics to dominant cultural narratives about mathematics. Participants suggested teaching responses to shift the classroom learning ecology toward their shared vision such as providing students with opportunities to recognize each other's mathematical strengths. Throughout this conversation, participants considered Albert's perspective and connected his mathematical experience to different aspects of the learning ecology and to ambitious and equitable mathematics teaching. These ways of participating were generative for the conversation in that they led to new ways of understanding the issue and they were generative for ongoing teacher learning in that analyzing and problematizing what we think we see in the classroom is integral to creating a classroom math community that functions very differently from what is currently typical in schools.

This shift toward relational investigation supported teachers to try out new practices in their classroom teaching that were responsive to the complex classroom learning ecology. For example, the story described above about Albert was part of Tina's investigation over time into the problem of practice of expanding students' conceptions of mathematics and mathematical competence. The investigation of Albert's experience both during this conversation and during my visits to the classroom prompted Tina to implement new routines to provide students with structured opportunities to recognize each other's mathematical strengths. After the conversation described above, Tina drew on ideas offered from different participants to try out a new routine of having students write down each other's mathematical strengths at the end of partner math tasks. By the end of the year, Tina reported, and I observed, that students were spontaneously noticing and naming each other's mathematical strengths using specific mathematical language (e.g. "finding easier ways to count the cubes using multiplication and arrays", field notes 4/12/17) even when she did not use this routine. This indicates that Tina's relational investigation led to shifts in her teaching that were consequential for her students.

The shift from engaging with teaching as fixing local problems to engaging in relational investigations of teaching and learning supported Math Crew teachers to think deeply about their classroom learning ecology, to take up complex problems of practice, and to work on them over time in ways that were responsive to students' experiences of mathematics. This new equity-oriented learning became possible because participants were part of a community oriented toward a shared vision that fostered new forms of activity such as supporting teachers to come to see the mathematics classroom from their students' perspective.

Conclusion

In Math Crew, first-year teachers moved beyond focusing on the overwhelming list of day-to-day concerns that tend to dominate for most first-year teachers to dig into complex problems of practice and to consider how their teaching choices might shift the classroom learning ecology to support each student to meaningfully contribute to the mathematical work of their classroom.

The first year of teaching is often talked about in terms of "survival" rather than in terms of possibility. I offer Math Crew as a counter story to deficit narratives about the first year of teaching with the aim of raising both our sense of possibility and our sense of responsibility about supporting beginning teachers toward ambitious and equitable math teaching. If we hope to support this type of equity-oriented learning, this case suggests that it can be productive to move beyond thinking about the knowledge and practices we want teachers to master to think about the systems teachers are working within and how those systems can make available new forms of activity. Future work could build on these beginnings to investigate how we might design and support teacher communities oriented toward a shared vision across different pre-service and in-service contexts to support robust teacher learning.

References

Boaler, J. (2008). Promoting 'relational equity' and high mathematics achievement through an innovative mixed-ability approach. *British Educational Research Journal*, *34*(2), 167–194.

Cohen, E. G., Lotan, R. A., Scarloss, B. A., & Arellano, A. R. (1999). Complex instruction: Equity in cooperative learning classrooms. *Theory into Practice*, *38*(2), 80–86.

DeAngelis, K. J., Wall, A. F., & Che, J. (2013). The impact of preservice preparation and early career support on novice teachers' career intentions and decisions. *Journal of Teacher Education*, *64*(4), 338–355.

Engeström, Y. (2011). From design experiments to formative interventions. *Theory & Psychology*, *21*(5), 598–628.

Gutiérrez, K. D., & Jurow, A. S. (2016). Social design experiments: Toward equity by design. *Journal of the Learning Sciences*, *25*(4), 565–598.

Gutierrez, K., & Vossoughi, S. (2010). Lifting Off the Ground to Return Anew: Mediated Praxis, Transformative Learning, and Social Design Experiments. *Journal of Teacher Education*, *61*(1–2), 100–117.

Gutiérrez, R. (2008). A" gap-gazing" fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education*, 357–364.

Gutiérrez, R. (2013). The Sociopolitical Turn in Mathematics Education. *Journal for Research in Mathematics Education*, *44*(1), 37–68.

Gutstein, E. (2003). Teaching and learning mathematics for social justice in an urban, Latino school. *Journal for Research in Mathematics Education*, 37–73.

Horn, I. S. (2005). Learning on the Job: A Situated Account of Teacher Learning in High School Mathematics Departments. *Cognition and Instruction*, *23*(2), 207–236. https://doi.org/10.1207/s1532690xci2302_2

Horn, I. S., & Little, J. W. (2010). Attending to Problems of Practice: Routines and Resources for Professional Learning in Teachers' Workplace Interactions. *American Educational Research Journal*, *47*(1), 181–217.

Ingersoll, R. M., & Strong, M. (2011). The Impact of Induction and Mentoring Programs for Beginning Teachers A Critical Review of the Research. *Review of Educational Research*, *81*(2), 201–233.

Jackson, K., & Cobb, P. (2010). Refining a vision of ambitious mathematics instruction to address issues of equity. In *annual meeting of the American Educational Research Association, Denver, CO*.

Kazemi, E., Franke, M., & Lampert, M. (2009). Developing pedagogies in teacher education to support novice teachers' ability to enact ambitious instruction. In *Crossing divides: Proceedings of the 32nd annual conference of the Mathematics Education Research Group of Australasia* (Vol. 1, pp. 12–30).

Leonard, J., & Martin, D. B. (2013). *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse*.

Martin, D. B. (2003). Hidden assumptions and unaddressed questions in mathematics for all rhetoric. *The Mathematics Educator*, *13*(2), 7–21.

Martin, D. B. (2009). Researching race in mathematics education. *Teachers College Record*, *111*(2), 295–338.

McDermott, R., & Raley, J. (2011). Looking Closely: Toward a Natural History of Human Ingenuhy. *The Sage Handbook of Visual Research Methods*, 372.

Mehta, J., Theisen-Homer, V., Braslow, D., & Lopatin, A. (2015). From quicksand to solid ground: Building a foundation to support quality teaching. *Transforming Teaching*.

Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity*, *1*(4), 209–229.

Shah, N. (2017). Race, Ideology, and Academic Ability: A Relational Analysis of Racial Narratives in Mathematics. *Teachers College Record*, *119*(7).

Warren Little, J. (2002). Locating learning in teachers' communities of practice: Opening up problems of analysis in records of everyday work. *Teaching and Teacher Education*, *18*(8), 917–946.