ADDRESSING EQUITY AND DIVERSITY ISSUES AROUND EXPANSION, DISPLACEMENT, AND GROWTH IN MATHEMATICS EDUCATION

Juanita Silva
Texas State University
jsilva@txstate.edu

Marrielle Myers
Kennesaw State University
mmyers22@kennesaw.edu

Ricardo Martinez
Iowa State University
ricardom@iastate.edu

Jennifer M. Langer-Osuna
Stanford University
jmlo@stanford.edu

Joel Amidon
University of Mississippi
jcamidon@olemiss.edu

Embracing the theme of this year's meeting, we seek as a community to consider the role of expansion, displacement, and growth in mathematics education in the privileging of some and marginalizing of others. Following on the topics discussed at the Working Group between 2009-2018, this year the focus is on balancing the need to reflect and collect around issues of equity and diversity in mathematics education and orienting toward action. Each session is designed to address the needs of (or to create opportunities for) attendees interested in equity, generating and brainstorming new subtopics, potential projects, and/or working to establish standalone working groups dedicated to furthering research on equity. The purpose being to encourage a move away from "big-tent" equity thinking and toward more productive working collectives.

Keywords: Equity and Diversity

Brief History

This Working Group originates from the Diversity in Mathematics Education (DiME) Group, one of the Centers for Learning and Teaching (CLT) funded by the National Science Foundation (NSF). DiME scholars graduated from one of three major universities (University of Wisconsin-Madison, University of California-Berkeley, and UCLA) that comprised the DiME Center. The Center was dedicated to creating a community of scholars poised to address critical problems facing mathematics education, specifically with respect to issues of equity (or, more accurately, issues of inequity).The DiME Group (as well as subsets of that group) has engaged in important scholarly activities, including the publication of a chapter in the *Handbook of Research on Mathematics Teaching and Learning* which examined issues of culture, race, and power in mathematics education (DiME Group, 2007), a one-day AERA Professional Development session examining equity and diversity issues in mathematics education (2008), a book on research of professional development that attends to both equity and mathematics issues with chapters by many DiME members and other scholars (Foote, 2010), and a book on teaching mathematics for social justice (Wager & Stinson, 2012) that also included contributions from several DiME members. In addition, several DiME members have published manuscripts in a myriad of leading mathematics education journals on equity in mathematics education. This working group provides a space for continued collaboration among DiME members and other colleagues interested in addressing the critical problems facing mathematics education.

It is important to acknowledge some of the people whose work in the field of diversity and equity in mathematics education has been important to our work. Over time, the Working Group has encouraged building on and featuring senior scholars' work, including Jo Boaler (Boaler,

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.

2002), Walter Secada (Secada, 1992), Marta Civil (Civil, 2007; Civil & Bernier, 2006; González, Andrade, Civil, & Moll, 2001), Eric Gutstein (Gutstein, 2003, 2006; Gutstein & Peterson, 2013), Jacqueline Leonard (Leonard, 2007; Leonard & Martin, 2013), Danny Martin (Martin, 2000, 2009, 2013), Judit Moschkovitch (Moschkovich, 2002), Rochelle Gutiérrez (2002, 2003, 2008, 2012, 2013) and Na'ilah Nasir (Nasir, 2002, 2011, 2013; Nasir, Hand & Taylor, 2008; Nasir & Shah, 2011). We have as well been building on the work of our advisors, Tom Carpenter (Carpenter, Fennema, & Franke, 1996), Geoff Saxe (Saxe, 2002), Alan Schoenfeld (Schoenfeld, 2002), Megan Franke (Kazemi & Franke, 2004), and Anita Wager, (Wager & Stinson, 2012) as well as many others outside of the field of mathematics education.

Previous iterations of this Working Group at PMENA 2009 – 2013, and 2015-2016 have provided opportunities for participants to continue working together as well as to expand the group to include other interested scholars with similar research interests. Experience has shown that collaboration is a critical component to this work. These efforts to expand participation and collaboration were well received; more than 40 scholars from a wide variety of universities and other educational organizations took part in the Working Group each of the past six years. Starting in 2017, an effort was made to "reset" the group toward providing opportunities for a new generation of scholars whose work intersects with issues of equity/inequity, diversity/inclusion, privilege/oppression, and justice in mathematics education research, practice, and development.

Focal Issues

Under the umbrella of attending to equity and diversity issues in mathematics education, researchers are currently focusing on such issues as teaching and classroom interactions, professional development, prospective teacher education (primarily in mathematics methods classes), factors impacting student learning (including the learning of particular sub-groups of students such as African American students or English learners), and parent/family/community perspectives. Much of the work attempts to contextualize the teaching and learning of mathematics within the local contexts in which it happens, as well as to examine the structures within which this teaching and learning occurs (e.g. large urban, suburban, or rural districts; under-resourced or well-resourced schools; and high-stakes testing environments). How the greater contexts and policies at the national, state, and district level impact the teaching and learning of mathematics at specific local sites is an important issue, as is how issues of culture, race, and power intersect with issues of student achievement and learning in mathematics. There continues to be too great a divide between research on mathematics teaching and learning and concerns for equity.

The Working Group has begun and will continue to focus on analyzing what counts as mathematics learning, in whose eyes (and for whose benefit), and how these culturally bound distinctions afford and constrain opportunities for traditionally marginalized students to have access to mathematical trajectories in school and beyond. Further, asking questions about systemic inequities leads to methodologies that allow the researcher to look at multiple levels simultaneously. This research begins to take a multifaceted approach, aimed at multiple levels from the classroom to broader social structures, within a variety of contexts both in and out of school, and at a broad span of relationships including researcher to study participants, teachers to schools, schools to districts, and districts to national policy.

Some of the research questions the Working Group will continue to consider are:

- What are the characteristics, dispositions, etc. of successful mathematics teachers for *all* students across a variety of local contexts and schools? How do they convey a sense of purpose for learning mathematical content through their instruction?
- How do beginning mathematics teachers perceive and negotiate the multiple challenges of the school context? How do they talk about the challenges and supports for their work in achieving equitable mathematics pedagogy?
- What impediments do teachers face in teaching mathematics for understanding?
- How can mathematics teachers learn to teach mathematics with a culturally sustaining approach?
- What does teaching mathematics for social justice look like in a variety of local contexts?
- What are the complexities inherent in teacher learning about equity pedagogy when students come from a variety of cultural and/or linguistic backgrounds all of which may differ from the teacher's background?
- What are dominant discourses of mathematics teachers?
- What ways do we have (or can we develop) of measuring equitable mathematics instruction?
- How do students' out-of-school experiences influence their learning of school mathematics?
- What is the role of perceived/historical opportunity on student participation in mathematics?
- Whose mathematics is accepted? (displaced?) across a variety of local contexts and schools?
- How are students' out-of-school experiences valorized in their learning of everyday mathematics?
- How do we make space for this work to continue with open opposition to critical approaches to mathematics education?

We believe the continued support of this working group provides a partial response to the last question. Specific to the intent of this year's Working Group, we will organize around questions like the ones above in order to create specific, targeted working groups that are charged to address and act around such questions.

Plan for Working Group

Based on feedback from the previous year and the emergence of new working groups related broadly to "equity," this working group has shifted toward a renewed focus on facilitating "collaboration within the growing community of scholars and practitioners concerned with understanding and addressing the challenges of attending to issues of equity and diversity in mathematics education." We have reconfigured the working group toward being a catalyst for new spaces instead of a "destination" for the inclusion of equity discourse within the PME-NA organization. To put it differently, our vision for the working group is to bring together attendees toward developing their own agendas and specific working groups related to equity-oriented themes--or toward themes that push the field beyond traditional equity discourses yet adhere to the needs and challenges of inequity within mathematics education.

Our plans for PMENA 2019 will proceed as follows. Each session will build on previous sessions, beginning with a facilitated conversation around the previously stated purpose of the working group. The format for the sessions will include:

- DAY 1: Opening up a day of reflection: Welcome, Introductions, Norm Setting. We will then ask each attendee to reflect on their experiences and write out examples of displacement, expansion, and growth in mathematics education that privileged some and marginalized others. Session attendees can generate examples from any time period. To encourage a wide variety of examples, we will ask attendees to think about these experiences as they relate to K-12 classrooms, with preservice teachers (methods or content courses), in student teaching, in undergraduate mathematics courses, in professional development settings, in the media, etc. From there, we will devote time to trying to categorize all of the examples (written on sticky notes) by themes to identify what types of categories emerges from this activity. We will conclude Day 1 by engaging in a whole group discussion where we will operationalize the ways in which mathematics has been used as tool to displace and marginalize. After operationalizing these examples, we will generate guiding questions to be used throughout the conference. As a collective, we will use (and ask) these questions at plenary sessions, individual presentations, etc to ensure that the conference theme remains at the forefront for all attendees.
- DAY 2: Finding common ground: Developing problem trees. Utilizing emerging themes from day 1, we will engage participants in an activity problematizing issues in mathematics education. The activity, a problem tree (Cammarota, Berta-Avila, Ayala, Rivera & Rodriguez, 2016) is used to distinguish between superficial symptoms and underlying root causes of societal issues, towards the development of a research question. Participants will work in small groups to create their own problem trees, generating a research question that will be presented to the whole group further enriching the collective discussion on issues of equity and diversity in mathematics education and resulting in potential collaborations to be built on in Day 3.
- DAY 3: Working working groups: Newly established subgroups will "take flight" and initiate plans to support their chosen topics/research questions through continued collaboration.

Previous Work of the Group

The Working Group met for productive sections since 2009. In 2009, participants identified areas of interest within the broad area of equity and diversity issues in mathematics education. Much fruitful discussion was had as areas were identified and examined. Subgroups met to consider potential collaborative efforts and provide support. Within these sub-groups, rich conversations ensued regarding theoretical and practical considerations of the topics. In addition, graduate students had the opportunity to share research plans and get feedback. The following were topics covered in the subgroups:

- Teacher Education that Frames Mathematics Education as a Social and Political Activity
- Culturally Relevant and Responsive Mathematics Education
- Creating Observation Protocols around Instructional Practices

- Language and Discourse Group: Issues around Supporting Mathematical Discourse in Linguistically Diverse Classrooms
- A Critical Examination of Student Experiences

As part of the work of these subgroups, scholars have been able to develop networks of colleagues with whom they have been able to collaborate on research, manuscripts and conference presentations.

As a result of the growing understanding of the interests of participants (with regard both to the time spent in the working group and to intersections with their research), we began to include focus topics for whole group discussion and consideration and continued to provide space for people to share their own questions, concerns, and struggles. With respect to the latter, participants have continually expressed their need for a space to talk about these issues with others facing similar dilemmas, often because they do not have colleagues at their institutions doing such work or, worse yet, because they are oppressed or marginalized for the work they are doing. These concerns, in part, informed the focus topics for whole group discussion and consideration. For example, in 2009 research protocols (e.g., protocols for classroom observation, video analysis and interviewing) were shared to foster discussions of possible cross-site collaboration. In 2012, the Working Group explicitly took up marginalization in the field of mathematics education with a discussion about the negotiation of equity language often necessary for getting published; this was done in the context of the 'Where's the mathematics in mathematics education' debate (see Heid, 2010; Martin, Gholson, & Leonard, 2010). Dr. Amy Parks was invited to join Working Group organizers to share reflections on their experiences. In 2013 the Working Group hosted its first panel in which scholars (Dr. Beatriz D'Ambrosio, Dr. Corey Drake, Dr. Danny Martin) shared their perspectives on the state of and new directions for mathematics education research with an equity focus. In recent years, we have had collections around topics that have resulted in several proposals for sessions and working groups for PMENA.

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