

# Embracing the Inherent Tensions in Teaching Mathematics From an Equity Stance

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**A**NY EFFORTS TO deal with definitions like “democracy” and “equity” must begin with the question of who gets to decide what counts in these categories. As researchers and educators grapple with persistent inequities in mathematics teaching and learning, equity issues are becoming more mainstream in the mathematics education community. Even so, theoretical framings tend to reflect equality rather than justice, static identities of teachers and students rather than multiple or contradictory ones, and schooling rather than education (Gutiérrez, 2002a; 2007). The prevailing discourse in the United States, focusing on the “achievement gap,” is a prime example. That is, the excessive focus that U.S. researchers place on the gap between the mathematics achievement of White, middle-class students and that of African American, Latina/Latino, American Indian, and working class students, as well as English language learners, and the need to close the gap (termed “gap gazing”) sheds light on issues of access and achievement from a dominant perspective with little concern for issues of identity and power or broadened notions of learning from a critical perspective.

## **Current Framings of Equity**

Although mainly concerned with the well-being of marginalized students (defined here as African American, Latina/Latino, American Indian, working class, and English language learners), mathematics education researchers

who focus on the achievement gap can unknowingly support practices that are against the best interests of those students. Some of the dangerous effects of gap gazing include: offering little more than a static picture of inequities; overlooking many assumptions embedded in measurement tools; supporting deficit thinking and negative narratives about marginalized students; accepting a static notion of student identity; relying upon a comparison group; dividing and categorizing students; offering a “safe” proxy for talking about students of color without naming them or acknowledging racism in society; perpetuating the myth that the problem (and therefore solution) is technical in nature; and relying upon narrow definitions of learning and equity (Gutiérrez, 2008).

Regardless of whether one operates in a setting that explicitly articulates an achievement gap focus or evaluates teachers on their ability to close the gap, the fact that educational researchers, the media, and professional organizations

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such as the National Council of Teachers of Mathematics are focusing on the gap makes it difficult to reframe one's work in other ways. Poststructuralism offers a useful way of explaining how this happens. When we focus upon something intently, it allows us to see only those things that are within our view. Our focusing thereby allows for only certain "truths" to arise (Foucault, 1980; Walshaw, 2007). These "truths" are not universal or fixed. Rather, they are constructed by our choice of focus. For example, in the achievement gap story, at best (by closing gaps), we can show that students of color are capable of doing as well as middle-class Whites; at worst (by failing to close gaps), we reify the notion that perhaps the intellectual capacity of students falls on a "natural" hierarchy that is coded by ethnicity/race.

From a poststructuralist perspective, it is the mere gaze that gives authority to a particular discourse about equity. Here, the discourse is one that focuses on standardized test scores and the kinds of students who are capable of doing well in mathematics. As a result, students of color continue to be framed in comparison to Whites; this comparison then becomes normalized, as if it is a "natural" way of thinking about achievement, rather than focusing on the excellence of students of color (Hilliard, 2003) or the many other ways subordinated students make sense of their experiences in mathematics classrooms.

By providing the categories by which teachers and students see themselves, the gaze further serves to regulate bodies in ways that shut down other possible discourses and technologies within school. A good example of this is when school districts hire testing companies to tell them how to "close the gap" in the kinds of students making adequate yearly progress (AYP) under the policy of No Child Left Behind. These testing companies, in turn, send consultants who instruct teachers to place their efforts on "bubble kids," students who are *on the bubble* of making AYP, rather than on students who are far from making AYP. Presumably, bubble kids are a better bet, as they require less effort to show gains in student progress. As such, what started as a mere focus (a gaze) has now turned to influence the pedagogies teachers might use, and even possibly the kinds of

students they may write off as requiring too much effort for the kind of aggregate achievement gains deemed valid by national policies.

Teachers who may have thought of their work in much more complex ways may find themselves ignoring other signs of excellence (e.g., improved inter-group relations in students, greater student participation in advanced mathematics courses, positive dispositions towards mathematics, students having improved/broadened visions of their futures, the ability to see that mathematics is socially constructed). This kind of self-regulation occurs because schools shape, monitor, and discipline the knowledges, modes of operating, and positionings of teachers (Walshaw, 2007). So, even if an administrator is not explicitly asking teachers to act in particular ways, the mere threat of broader surveillance, of wanting to fit in with what is deemed acceptable or professional, is enough to affect the technologies (practices) seen to be valid. Thus, the work of teacher educators in unveiling this process is critically important.

As a Chicana whose research has focused on effective mathematics learning environments for African American, Latina/Latino, working-class White, and other subordinated communities, I argue that we need to shift the conversation in teacher education away from the achievement gap to one that more easily exposes complex issues of identity and power and better reflects the interpretive activity involved in learning to teach (Britzman, 2003). If we expect to prepare both students and future teachers for a more participatory democracy (Skovsmose & Valero, 2001), a focus on tensions in teaching from an equity stance is one place to start.

### **Preparing Teachers to Engage Students in a Global Society**

Over the past 13 years, I have been active in preparing University of Illinois mathematics majors to become high school mathematics teachers with an equity stance. Toward that end, my strategies have varied from a "sledge hammer" (and admittedly naïve) approach of assigning readings early in the year about White privilege and power (e.g., McIntosh, 1990; Darder & Torres, 2002), to more subtle approaches of

reading articles on equity, language, culture, and mathematics alongside of doing social justice mathematics activities, to activities that get my students to empathize with being the “other,” and more recently to engaging my students in partnerships with local communities.

On the one hand, my central aims in preparing preservice teachers are to help them develop knowledge and skills about effective mathematics teaching in marginalized communities. I do this so they can become advocates for their students. As such, part of my work is convincing preservice teachers that the “achievement gap” is a social construction, a residue created from our choice of focus (as described earlier), and something that becomes reified if we continue to focus on it to the exclusion of other things. Towards this end, I follow what many teacher education programs across the nation are doing—requiring preservice teachers to learn through readings about success stories,

## Teaching mathematics is not a politically neutral activity.

rather than failures. From such readings, preservice teachers gain a better understanding of the power of using high quality mathematics curricula with marginalized students and providing sufficient supports for engaging in a rigorous mathematics curriculum (e.g., Education Trust, 2005; Gutiérrez, 1996; Kitchen et al., 2007); organizing teacher communities to support all students advancing in mathematics (e.g., Gutiérrez, 2002b; Boaler, 2006), and about the roles of culture, language, and race in mathematics (e.g., Gutstein et al., 1997; Jilk, 2007; Moschkovich, 2002; Tate, 1994; Zevenbergen, 2000). In their lesson plans, reflection papers, and interactions with local schools, preservice teachers are expected to put their knowledge about successful teaching in these environments in action. These readings and activities require my preservice teachers to take seriously the notion of increasing access and achievement in

school mathematics. If their future students are going to be taken seriously, preservice teachers need to be able to support their students in learning to *play the game* called mathematics. That is, their students need to do well on standardized tests and have opportunities to engage in quality mathematics, as such measures will continue to carry weight in society.

On the other hand, if students are forced to assimilate in class in order to participate in the game of (school) mathematics, if they are required to isolate mathematics from the real issues that are meaningful in their lives outside of school, if they are expected to learn a mathematics devoid of history, if they are expected to measure up only to current levels of achievement attained by middle-class White students rather than broader notions of excellence—that is not equity. Along those lines, a growing body of literature in mathematics education also implies that teachers (and preservice teachers) should help their students learn to not only play the game of mathematics, but also *change the game*. Changing the game of mathematics means partly rewriting the narrative about who contributes to mathematics and who does well in it. It also means offering new ways of envisioning school mathematics by considering home communities and other ways of viewing the world. Changing the game of mathematics also means students are able to use mathematics to acknowledge hegemony in society and can address social and political issues of importance to their communities. From the point of view of teacher educators, changing the game of mathematics also means preparing students to think more critically about both mathematics and mathematics education so that they might become critical citizens rather than mere consumers in a capitalist society. As such, preservice teachers might consider the literature and engage in activities ranging from ethnomathematics (e.g., D’Ambrosio, 1990) to out-of-school mathematics (e.g., Abreu and Cline, 2007; Nasir, 2000) to critical and social justice mathematics (e.g., Frankenstein, 1995; Gutstein, 2006; Gutstein & Sia, 2007), even the sociology of mathematics (e.g., Restivo, 1992). All of these approaches begin to help preservice teachers see that teaching mathematics is not a politically neutral activity.

However, developing a pedagogy that both helps one's students play the game and change the game is complex work. Inevitably, it requires getting preservice teachers to see that such work will not be learned completely in a teacher education program or through readings about the lives of "others" and/or their successful teachers, or curricular activities that expose a non-Western view of mathematics or a critical view onto the world. In order to prepare them for this work, I engage them in a program that foregrounds the notion of tensions in teaching.

I will focus my comments on a particular year-long partnership with a Chicago public high school serving primarily Latina/o working-class students. In this partnership, 23 of my preservice students visited the school and community, were paired with a high school student to conduct email correspondence, completed Interactive Mathematics Program

## We need to shift the conversation in teacher education away from the achievement gap.

(IMP) activities in which the high school classes were engaged (Alper, Fendel, Fraser, and Resek, 1997), watched video clips of mathematics teaching and learning in that school, debriefed those lessons with the practicing teacher, developed curricular materials for those classrooms, and hosted a field trip for the high school students to visit the university where the preservice teachers were enrolled (see Gutiérrez, 2004, for a fuller description of the partnership). During that year, several tensions arose that my preservice teachers needed to grapple with in order to take seriously a notion of equity that moves beyond access and achievement and begins to address issues of identity and power.

Elsewhere, Gutstein (2007) offered dilemmas in teaching mathematics for social justice. In a similar vein, I offer tensions that are useful in developing in teachers a "stance" on

teaching that addresses identity and power issues. I will focus my attention on three of these tensions, as I see them as appropriate across multiple contexts. These tensions surround the idea that an equity stance means: 1) knowing your students and not knowing them; 2) being in charge of the classroom and not being in charge of the classroom; and 3) teaching mathematics and not teaching mathematics. Let me explain.

### 1. KNOWING YOUR STUDENTS AND NOT KNOWING THEM

One prominent goal in the literature on teaching mathematics for equity is getting to know one's students. In a situation where socio-cultural theories abound, this has meant more than just knowing how one's students function cognitively. It also means knowing what cultural and linguistic resources they might bring to the classroom and/or what dispositions they may hold towards mathematics and its relation to their futures.

At first, getting to know their students (especially those who were economically, linguistically, culturally, and racially positioned differently from themselves) was not a high priority for my preservice teachers. They tended to project an image that their future students would share many of the same characteristics—motivated, college-bound, with parents who had attended college and who could help them negotiate the schooling process. Soon they realized that a key feature of the success that our partner teacher exhibited was rooted in the relationships he (a White, male, monolingual teacher) had with his Latina/o, African American, and bilingual students. The preservice teachers recognized, after much hard work (they were not prepared for these urban students *not* to want to know White college students) that such a process of getting to know one's students is not easy. Having casual conversations about their lives in the school hallways, asking about their day at the beginning of class, offering projects that let students choose a topic or express their interests, letting students use Spanish freely in the classroom, all lent themselves towards our partner teacher building trust and solidarity, something to which a textbook or case study could never measure up.

Later in the year, once the high school students started to open up, my preservice teachers fell into the trap of thinking they “knew” these students. They began to make public statements and build lesson plans based on these assumptions. It took several reminders from our practicing teacher for them to recognize that they were barely in touch with the complex identities of their email partners, students who even the practicing teacher was still continuing to get to know. To my preservice teachers, his relationships with students appeared strong; yet he characterized these same relationships as “fragile.” Such statements left my preservice teachers frustrated. How were they ever to going get to know their students if it involved this much work?

However, our practicing teacher and the experiences my preservice teachers had in the partnership helped highlight a key tension that I argue an equity stance reflects. Such teaching requires an educator do everything she or he can to get to know the students, all while recognizing that one’s students can never be known (in an essentialist or objectified way). My preservice teachers began to develop an appreciation for the fact that even when a teacher does everything possible to get to know the students, to open up to them, to engage in the community and activities of interest to them, those very students may not choose to open up or offer aspects of their identities in ways that one expects. Engaging this tension means being willing to open up the classroom for students to select projects of their own making, but not passing judgment on them if those projects are not viewed as “authentic” or their participation in mathematics class seems to presume “acting White.” In fact, as other researchers have found (Stinson, in press), for many of the high school students in our partnership, doing well in math class did not represent a sign of “Whiteness.” Rather, their success signaled they were meeting the expectations of their admittedly demanding teacher, something anyone could do with effort. It is partly the ability to see the complex, at times contradictory, stances of one’s students that allows for an equity pedagogy.

## 2. BEING IN CHARGE OF THE CLASSROOM AND NOT BEING IN CHARGE OF THE CLASSROOM

A second tension surrounds the role the teacher plays inside the classroom. *The Principles and Standards for School Mathematics* (NCTM, 2000) and other reform-oriented documents imply teachers should be facilitators in the classroom—encouraging students to explore and discover concepts without dictating how. Although having bought into many of the tenets of a pedagogy that offers greater “author(ity)” to students (Povey & Burton, 1999), many of my preservice teachers did not understand why they could not convince some of their email partners of the value of mathematics. Again, projecting from their own position and without acknowledging the history of racism and schooling in the U.S., they expected that an engaging lesson was enough to hook the students. In some respects, they wanted to see technical solutions to non-technical problems.

The partnership highlighted the tension that while a teacher is in charge of the classroom, she or he cannot force students to come on board. An equity stance here is embracing the idea of coercive participation without coercing participation. That is, teachers must employ all tools and relationships at their disposal in order to invite students to participate, but participation is, in the end, up to the student. To be clear, recognizing that one cannot *will* students to learn is not an excuse for relinquishing responsibility for such learning. In fact, to pretend that, as a teacher, one does not have authority is dishonest. Regardless of how dedicated a teacher is to building a community of learners and offering students the ability to become “authors” on the math classroom, preservice teachers must recognize that they are also in charge of the classroom and all learning that takes place. The same is true in our current times of high-stakes education. On the one hand, teachers are not in charge of their classrooms as they are required to standardize their curriculum with other teachers in the school and are left with little room for innovation. Yet, they are ultimately in charge of their classrooms in the sense of how that curriculum is carried out in the relationships and examples used inside and outside of class hours. Every good teacher knows that some level

of creative insubordination (i.e., learning to bend the rules) is important if one aims to be an advocate for students.

### 3. TEACHING MATHEMATICS AND NOT TEACHING MATHEMATICS

Most high school mathematics teachers identify more readily with the discipline of mathematics than with their high school students. In some ways, holding tightly to mathematics as a defining feature of one's work serves as a form of protection against the devalued nature of education in relation to other job prospects these teachers could have pursued. Being a teacher who teaches only mathematics holds much higher esteem than a teacher who teaches additional subjects, such as is the case in middle or elementary school. My preservice teachers were no exception. They were mathematics majors and education minors, allowing their

## Students of color continue to be framed in comparison to Whites.

work to be defined first and foremost by the mathematics. So, getting them to see that they also teach students, not just mathematics, was an important part of helping them develop their equity pedagogy. This idea was related to the first tension about getting to know one's students.

At one point when my preservice teachers were grappling with the fact that the math curriculum was not very attentive to the lived experiences of the high school students, they watched as the practicing teacher developed supplementary materials that aimed to get at the high school students' social and (presumed?) political interests. On the one hand, my preservice teachers saw the value of original materials that showed that the teacher understood the different positions and positionings of students in society. In the process, my preservice teachers also saw how difficult it was to develop anti-

racist or social justice mathematics curricula and also maintain a high level of mathematical rigor. In the end, they realized there was some value in trying to balance the two, but left wondering which was supposed to be more important—teaching students or teaching mathematics?

Again, the interpretive process inherent in the partnership helped highlight how a pedagogy focused on equity engages the identities of students and the power relations that relate to those identities. That is, although teachers must recognize they are teaching more than just mathematics, they also have to reconcile that fact with the idea that, ultimately, they are responsible for helping students learn mathematics. Teachers who are committed to equity cannot concern themselves with their students' self-esteem and negotiated identities to the exclusion of the mathematics that the students will be held responsible for in later years. Yet, preparation for the next level of mathematics must also not be the overriding feature of a teacher's practice. In answer to which of the two foci are important (teaching students or teaching mathematics), I would answer "neither and both." It is in embracing the tension (not choosing between the two) that allows teachers to develop their own authentic practices and political clarity around issues of equity.

### Conclusion

Rather than delineating a list of practices that are important for ensuring that mathematics prepares students for a more democratic citizenship, I have outlined here three tensions in teaching that I argue are important in developing an equity stance in mathematics education. This focus on a "stance" suggests that the kinds of practices that teachers choose to embody will be different depending upon the contexts in which they work and the particular points in history in which they participate. That is, there is no single best practice for reaching African Americans, Latina/os, American Indians, English language learners, or other subordinated populations. The identities of students and the politics of education will continue to reshape and remake mathematics education as we move forward in a global society (Pieterse, 2004). The sooner preservice and practicing teachers learn that

how they position themselves with respect to their students and the field is as important (if not more so) than the bodies of knowledge they “learn” in a teacher education program (Britzman, 2003; Brown & McNamara, 2005), the better they will become at dealing with the complexities that arise in teaching when transformation of society, not mere “student achievement,” is the goal.

A shift away from a socio-psychological view towards a socio-political one (Valero, 2004) helps us see the potential of teachers rewriting the narrative in mathematics education to more adequately prepare students for a participatory democracy. While the discourse of the achievement gap is dominant and has the power to shape teacher practice, poststructuralism reminds us that discourses are malleable. Where power is created, cracks always arise and allow for resistance. Therefore, subverting and/or (re) signifying (Butler, 1999) the discourses operating in schooling (e.g., rejecting an achievement gap focus or positioning it as an inadequate goal) is a means of regaining charge of the mathematics classroom and life as a professional.

More than just emphasizing the need to help students play the game of mathematics as defined by dominant society, we need to see our work as teacher educators as also supporting teachers to develop a counternarrative to limited discourses like the achievement gap that can alienate teachers from their wisdom and disconnect research from practice (Jilk, 2004). Learning to embrace the tensions that are a natural part of an equity practice better reflects the uncertainties in teaching (Edwards, Gilroy, & Hartley, 2002) and the constant reframing of education and mathematics that occurs in everyday practice. In my experience as a teacher educator who is dedicated to issues of social justice, there are many more tensions that are important to embrace. However, the three I have highlighted here begin the process of privileging equity over equality, education over schooling, and power/identity over mere access and achievement.

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