

PUBLIC STORIES OF MATHEMATICS EDUCATORS

Changing the Balance in an Unjust World: Learning to Teach Mathematics for Social Justice

Joan Kwako

University of Minnesota Duluth

In 2007, the first *Creating Balance in an Unjust World Conference on Mathematics Education and Social Justice* convened in Brooklyn, New York (see <http://creatingbalanceconference.org/>). The conference was a forum for sharing ideas of social justice mathematics education. The organizers never intended it to be an annual event but due to the enormous amount of interest, they planned a second conference. The second conference was also held in Brooklyn with nearly 400 attendees, including researchers, teachers, and students spanning all educational levels from 26 states and 3 countries. Two preservice elementary teachers (Maria and Claire [pseudonyms]) and I, a mathematics methods teacher, traveled from Minnesota to present at the conference. Maria summarizes how attending the *Creating Balance* conference affected both her view of teaching and of life:

The exposure to so many people, along with my presence at the *Creating Balance in an Unjust World Conference*, has given me a new perspective on people, education, and most importantly life. The visit has allowed me to see the importance and fragility of life. It has allowed me to see the importance of teaching the truth as well as teaching the gift of love, life, friendship, respect, and uniqueness. I was given the inspiration to teach these educational lessons whether they are life lessons, social lessons, or emotional lessons with passion, dignity, and genuineness.

The conference was a deeply moving experience for all of us, one I wanted to capture by documenting the effect it had on Maria and Claire both initially and when they started teaching in their own classrooms. I contacted Maria and Claire 2 years after the conference to compare their expectations about teaching mathematics for social justice with their current teaching experiences.

In this public story, I describe how teaching mathematics for social justice is expressed in the literature, explain how I engage students in teaching mathematics for social justice in my elementary mathematics methods class, and recount our experience of attending and presenting at the *Creating Balance* conference. I end

JOAN KWAKO is an assistant professor of mathematics education in the Education Department in the College of Education and Human Service Professions, at the University of Minnesota Duluth, 125 Bohannon Hall, Duluth, MN 55812; email: jkwako@d.umn.edu. Her research interests include alternative assessment, in particular, collaborative testing and teaching mathematics with and for social justice.

with stories of Maria and Claire's experiences teaching mathematics for social justice (or not) in their current classrooms, 2 years later.

Teaching Mathematics for Social Justice

Although it is not a new idea (see, e.g., Freire, 1970/1993), teaching for social justice has become a growing focus in education (Ayers, Quinn, & Stovall, 2009; Darling-Hammond, French, & Garcia-Lopez, 2002; McCoy, 2008; Zajda, 2010) and, more specifically, in mathematics education (Frankenstein, 1990, 1997; Gau, 2005; Gutstein, 2003, 2007; Gutstein & Peterson, 2005; Murrey, 2008; Peterson, 2005; Stocker, 2008). Definitions of social justice vary among teachers and researchers; the underlying ideas, however, are most often comparable. According to Gau (2005), "Social justice in education [is] a process of analyzing oppression and critiquing inequities while helping students identify how those issues connect to their lives, and engaging them in purposeful action to challenge those inequitable structures" (p. 7). As an educator, one of my core beliefs is that education can achieve positive social change; I urge my students to see not only mathematics but also every subject as pathways to that influence. As I have researched the relationship between social justice and mathematics education, I have developed a pedagogical philosophy in which I first work to develop awareness among preservice teachers of the many factors that contribute to the inequities in society. This process begins with observation and acknowledgement and continues when preservice teachers incorporate social justice issues in their classrooms.

When I began discussing social inequities with my students (future elementary teachers), I learned that many believe their students are unaware of the injustices of both *their* world and *the* world. The following statements exemplify many of my students' initial reactions to discussing social justice issues with elementary students:

We can't tell them that! They're too young! We need to take care of them, shelter them from the harsh realities, scary inequities and violence imposed on people—and children—in society. Children are innocent and incapable of understanding big problems.

My response to these students is, "Is that a child's perspective, or your perspective? Do you think that a child does not know that she or he is impoverished or homeless? Is it better to ignore the discrimination due to economic standing, the color of their skin, or living conditions that to many children experience daily? Or is it better to acknowledge the realities in which our children live, with the goal of changing those realities and expanding their possibilities?" When conventional mathematics curricula grow sterile and detached from the lives of students, stu-

dents lose interest. Mathematics lessons drawn from today's headlines may not always be pleasant, but the savvy teacher can integrate them into lesson planning in age-appropriate ways.

Most of my students (preservice teachers) have not experienced homelessness, abuse, or poverty but, at some point in their careers, all will surely teach children who have. By raising my students' awareness of the different realities and inequities that exist, they can create an environment in which *their* students are able to use the mathematics they learn through social justice contexts I provide to achieve social justice goals. My focus on social justice provides a context through which my students examine themselves and their roles as teachers and as members of our society.

Finally, I work to help my students understand that not only will they teach children who are victims of injustice but also that it is essential they recognize that these issues of injustice are not defining characteristics or qualities of the children, their families, or their culture. Instead, the issues are the result of social, political, and economic forces in society that shape their lives.

It is through these discussions and the design of mathematics lessons using a social justice context that I work to bring my students to a level of maturity and pedagogical awareness of social, political, and economic injustice. There is an obvious connection between social justice and social studies, between social justice and history, and even between social justice and literature. But mathematics? Yes, mathematics! It is possible to teach mathematics using contexts that illustrate societal imbalances. In this way, mathematics teachers can serve as advocates for positive social change.

Introduction to Social Justice Lessons

I initiate discussions about social justice with my preservice teachers by modeling lessons that focus on various inequities in our society. The first lesson, "Unequal Distribution of Wealth in the United States" from Eric (Rico) Gutstein and Bob Peterson's (2005) edited volume *Rethinking Mathematics: Teaching Social Justice by the Numbers*, requires students to analyze data and create a three-dimensional graph representing population and wealth distribution in the United States. Groups of students use a 10 square cm sheet of grid paper and 100 centimeter unit cubes to graph the following data: 1% of U.S. households owns 39% of the wealth, 19% of U.S. households own 46% of the wealth, and 80% of U.S. households own 15% of the wealth (Langyel, 2005). Generally, groups create one very tall tower (39 cubes high) on one square, 46 cubes spread out among 19 of the squares, and 15 cubes spread out over 80 of the squares. As the tower on one square grows to 39 cubes, it becomes a very powerful and startling image of the imbalance of wealth in the United States. Not all of the groups display the data the

same way; some assign different colored cubes a different value or use different-sized cubes to represent different amounts. Any debate about which graph more accurately reflects the data only adds to a conversation about representation of wealth distribution. It also deepens the mathematical understanding of how the way data are represented can significantly change the message that data might convey.

My students engage in and create lessons surrounding some disturbing topics, but I do not force any set doctrine; the numbers provide their own testimony. Some lesson topics include the cost of wars in Iraq and Afghanistan, discrepancy between salaries of CEOs of major U.S. retailers and salaries of those who actually make the products, racial profiling in arrests and the death penalty, and comparative wages of women and men in the same field. Engaging students in relevant mathematics helps students to use classroom mathematics to critically analyze numbers in their lives outside of the classroom.

Creating Balance in an Unjust World Conference for Mathematics Education and Social Justice

The social justice lesson plans notwithstanding; it was the experience of presenting at the *Creating Balance* conference that had the most profound impact on the two students who presented with me. We organized our presentation into an interview format. I had a list of open-ended questions for Claire and Maria intended to elicit the challenges and successes of designing elementary mathematics lessons using a social justice context. Although I gave them general questions ahead of time, we did not rehearse their answers; I wanted the presentation to be as authentic as possible. As such, conference attendees were encouraged to ask follow-up or clarifying questions; thus, the presentation became a live interview involving everyone in the room.

Immediately upon returning to Minnesota, both Claire and Maria wrote about their experiences at the conference. Below are their thoughts at that time, in 2008:

Claire: Our visit to the site where the World Trade Centers once stood was very shocking and emotional. It is impossible to explain the feelings of sadness and anger I experienced when visiting the memorial museum and site. I was sixteen years old when the events occurred on September 11, 2001, and I know what I did learn about the event was taught by my parents, not through any formal education. This was the moment that I confirmed my belief that the truth about the world's issues is not being taught enough in our schools today.

Claire realized that her only knowledge from one of the most devastating events in the last 10 years came from media, not from her teachers. Had her parents not

shared with her what happened, her knowledge about the event would have been superficial at best.

Maria: Teachers have to be very aware of the students, community, etc. when designing lessons using a social justice context. This is not always easy. As teachers, we do not want to single out someone or disrespect anyone. Social justice topics can really take a toll on students' emotions if it applies too directly to their lifestyle. We need to be respectful. All learners must be considered and incorporated into the design of the lesson.

Maria highlighted the care teachers must exercise when designing lessons that use delicate, unpredictable, and potentially controversial topics. For example, it would be a mistake to start discussing racial profiling in a multiracial classroom without significant conscious thought towards the impact the discussions will have on the children in the classroom, the school staff, and the parents. Designing such lessons is difficult, and is more challenging without institutional support:

Maria: It can be difficult to find support from colleagues as you present social justice topics. Not everyone wants to be involved because of the risk of getting fired or getting into trouble with administration. Sometimes colleagues will frown upon your willingness to question society and support what is right. I struggled with this. I had a cooperating teacher who was concerned about my lesson on overcrowded classrooms. I thought it was a great way for students to understand the importance of building safety and to question places in their community that may or may not be safe, *all the while teaching about area* (italics added). By questioning dangerous places, my students learned that they can make a difference and help to create a safer, more just society. This is what is important.

Maria, and later Claire, recognized the importance of having support from colleagues and administration when incorporating, in this case, an issue as seemingly uncontroversial as overcrowded classrooms:

Claire: Through the entirety of the conference and our presentation, my views were dramatically altered about educating students on our world issues of social justice. As teachers, we need to be leaders in the classroom and empower students to become future leaders through education about the truth of the real world. We also need to teach and encourage other educators to research and use their knowledge of real life political, social, and economic issues in their everyday classroom lessons. Each person at the conference shared their challenges in designing and implementing these lessons in the classroom, but it is the success of the students that is the most amazing. When social justice education is taught with another subject such as math, student interest and understanding rises. The lesson I learned is that as a teacher, I can provide my future students with the truth about today's world issues while still providing an education in core subjects such as math. Teaching students about social justice is crucial to the future of our world.

Her enthusiasm for teaching for social justice was apparent in 2008. Would it wane?

2 Years Later: 2010

Our world changed significantly in 2 years. I contacted Claire and Maria to see if the experiences with teaching mathematics for social justice both in my class and at the conference really affected how they now taught. The following are their 2010 responses to one of the question originally asked in the presentation at the *Creating Balance* conference.

Joan Kwako: I have come to realize that you can use mathematics to teach and learn about issues of social justice, and conversely, that such social issues can be the context to learn mathematics. Did the fact that we focused on social, political, and economic issues in my class have an impact on your teaching?

Maria: If there is a current local state, national, or world topic that can relate to a math topic we are learning or have learned, I utilize it. Students love to apply what they are learning to something that is meaningful. Aside from teaching what is going on in our world, I am also consistently faced with relating the lives of my students to what we learn. I have students who are living in poverty, families with children who are first generation Americans, and students with diverse backgrounds and life experiences...[which] allow my students to develop understanding, as many of them are English Language Learners. Therefore, their own experiences allow them to make connections and learn. I am fortunate in my school to have flexibility in what I teach. (Yet at times I am feeling the pressure of teaching to the test rather than relating topics to real life.) Many of my students have a deep understanding of the social issues that arise in conversation. It allows them to make a connection between the issue and the content that is being taught. It is amazing to see the connections being made.

This fall I gave my students information on Haiti and the problems they have been facing to create a deeper understanding of the word community. We viewed pictures of what a community looks like as well as Haiti and its community before, during, and after its disaster. We talked about what people have had to live without and how communities come together to help those when are in need. It has allowed many of my students to reflect on our learning community and what we stand for in our classroom. I have enjoyed seeing the change in some of my students' behaviors. Information on the past and current Haiti Community and our own learning community have proven to be not only effective, but meaningful. When students find meaning in what they learn, it is the best feeling in the world.

Claire: Even though I have not taught math with social justice, I have had many students ask about social, political, and economic issues during my teaching. I find a resource and teach the answer using the resource, not using my opinion. Oftentimes, I have had the students find the answer to their question on their own or by working with another student. Students can often teach each other if they have experience in the social issue topic. I believe the focus on social, political, and economic issues has impacted my teaching, whether or not I have taught using social justice in my

curriculum or had the opportunity to design and teach my own lessons. Social justice is always on my mind and I am constantly thinking about how it relates to my everyday life. I was reminded that diversity and social justice are two issues that are in our classrooms everyday and cannot be ignored. We should also remember that by incorporating social justice into our teaching that our students may be able to better relate, learn more about our world, and reach their full potential as learners.

I'm teaching in [Minnesota] as a long-term sub in second grade. I haven't had the opportunity to really create my own curriculum or really teach anything using social justice yet. I don't think there is a social justice component in either our math or literacy program. Also, I'm in the midst of trying to secure a full-time job, and am obviously not tenured. I am working in a district where parents and administrators track me all of the time, and I can only teach what I'm assigned to teach.

In Claire's last statement, she made it clear to me that she did not want her name, her school, or even her district mentioned, for fear of retribution. She clearly wants to incorporate issues of social justice in her classroom but does not feel she has the support to do so. Maria had a similar concern in the earlier interview. How do we, as teacher educators, help them? We can model teaching as a means for positive social change, which will equip them with the knowledge necessary to change the status quo, especially when that status quo is so inequitable. However, having the knowledge to change the status quo does not imply that beginning teachers can always stand up to administrative forces that come against them. Even so, as Gau (2005) states, "an important component in the literature on teaching mathematics for social justice...is that teaching mathematics for social justice is fundamentally about students learning mathematics" (p. 75). And isn't our entire purpose of teaching mathematics for students to learn mathematics?

Although it would be nice to take credit for the change in my students' perspectives, I know I was only a guide. I do believe that the focus on social justice in class and the opportunity to attend and present at the *Creating Balance* conference allowed my two students to recognize that real issues can provide rich contexts for learning mathematics. These contexts can serve to not only motivate students to learn and enjoy mathematics but also to expose them to—and thus work to change—the real social justice issues that exist in our country. It strikes me as counterproductive to separate mathematics from reality. If we choose to do so, we deserve the taunt that "math doesn't matter in their lives." They are wrong; mathematics surrounds us. It is the invisible web that became the Internet; it is the underpinnings of every economic transaction. Numbers chart the heights of human achievement and illustrate the depths of human despair. We cannot ignore things in an effort to wish them away; to change inequities, we must first acknowledge them. Lessons we choose for our students should reflect these intricate links to the real world. If we are to build enthusiasm, and at the same time, avoid aversion to mathematics, we need to connect it to what is real and important. As

teacher educators, it is our responsibility to prepare future mathematics teachers to teach for social justice and thus work to change the balance.

References

- Ayers, W., Quinn, T., & Stovall, D. (2009). *Handbook of social justice in education*. New York: Routledge.
- Darling-Hammond, L., French, J., & Garcia-Lopez, S. P. (2002). *Learning to teach for social justice*. New York: Teachers College Press.
- Frankenstein, M. (1990). Incorporating race, gender, and class issues in a critical mathematical literacy curriculum. *Journal of Negro Education, 59*, 336–347.
- Frankenstein, M. (1997). In addition to the mathematics: Including equity issues in the curriculum. In A. Trentacosta & M. Kenny (Eds.), *Multicultural and gender equity in the mathematics classroom*. Reston, VA: National Council of Teachers of Mathematics.
- Freire, P. (1993). *Pedagogy of the oppressed*. New York: Continuum. (Original work published 1970)
- Gau, T. R. (2005). *Learning to teach math for social justice* (Unpublished doctoral dissertation). University of Wisconsin-Madison, Madison, WI.
- Gutstein, E. (2003). Teaching and learning mathematics for social justice in an urban, Latino school. *Journal for Research in Mathematics Education, 34*, 37–73.
- Gutstein, E. (2007). “And that’s just how it starts”: Teaching mathematics and developing student agency. *Teachers College Record, 109*, 420–448.
- Gutstein, E., & Peterson, B. (Eds.). (2005). *Rethinking mathematics: Teaching social justice by the numbers*. Milwaukee, WI: Rethinking Schools.
- Langyel, M. (2005). Unequal distribution of wealth in the United States. In E. Gutstein & B. Peterson (Eds.), *Rethinking mathematics: Teaching social justice by the numbers* (pp. 68–69). Milwaukee, WI: Rethinking Schools.
- McCoy, L. P. (2008). Poverty: Teaching mathematics and social justice. *Mathematics Teacher, 101*, 456–461.
- Murrey, D. (2008). Making numbers count. *Teaching Tolerance, 33*, 50–55.
- Peterson, B. (2005). Teaching math across the curriculum. In E. Gutstein & B. Peterson (Eds.), *Rethinking mathematics: Teaching social justice by the numbers* (pp. 9–15). Milwaukee, WI: Rethinking Schools.
- Stocker, D. (2008). *Maththatmatters: A teacher resource linking math and social justice*. Ottawa, Canada: CCPA Education Project.
- Zajda, J. (Ed.). (2010). *Globalization, education and social justice*. Dordrecht, The Netherlands: Springer.