

## **Putting the “I” in Integrated Algebra: Equity and Efficacy in my Algebra Classroom**

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In this project lies the assumption that I am a resource on teaching. Trusting me as a resource implies that I am knowledgeable about best practices in education, specifically high school algebra education. My years as a student and a teacher have given me a measure of wisdom—wisdom that I have discounted and discredited as less powerful or meaningful than federal mandates, state standards, textbook curriculum, department procedures, and high-stakes tests. I have seen more and know more about student learning than the authors of state standards, textbook curriculum and most of my current fellow math department members.

I remember being a teacher in an environment where I concerned myself with treating each student as an individual, with individual skills, needs, aspirations and abilities. I remember managing a classroom where I set high expectations, and all students met those expectations. I taught algebra with applications and mathematical reasoning. I once knew that all students could do algebra, if given the opportunities and time to learn the content.

I liked teaching. I did not spend my days rushing through disconnected concepts to placate to state standards. I did not spend my days fretting that I might have not taught the exact mathematics necessary to earn my students a couple more points on the Regents exam. I was a much better teacher before I became a tool for the state of New York. I was a much better teacher before I worried about job shortages and tenure. I was a much better teacher when competition and state test scores were not high-stakes. I am glad to still have plenty of time

ahead of me, because I know that I can be a much better teacher. I intend to be an expert at teaching algebra. I will do my best for myself, and for my students. The question I am pursuing is: “How can I apply my learning from my undergraduate course in *Teaching the Inner City Child* (TICC) to my teaching of all students in any teaching location?”

TICC coursework, class discussions, research, and a couple of workshops at Cornell University have helped me define my beliefs about teaching. These are the beliefs I aspire to:

- 1). A quality algebra education should produce citizens who are empowered to think critically and problem solve.
- 2). A quality algebra education will promote equity, efficacy and good decision-making.
- 3). A quality algebra education is the gatekeeper for full citizenship and economic access, particularly for disadvantage and disenfranchised students. Therefore, a quality education must be a priority for all students.

This last belief was formalized by Dr. Robert Moses at a recent mathematics workshop at Cornell University. I was privileged to hear Dr. Moses explain the importance of my role in advancing all students. His message of the significance of algebra has even greater weight because he has dedicated his life to civil rights. A graduate of Stuyvesant High School, Hamilton College and Harvard University, Dr. Moses went on to teach in Manhattan at the Horace Mann School. By 1960 he was directing the Student Nonviolent Coordinating Committee (SNCC), facing intimidation and violence as he worked to register Black voters in Mississippi. Dr. Moses became the Council of Federated Organizations’ (COFO) co-director in 1964, leading the COFO’s Freedom Summer project. Dr. Moses has more than 20 years leading the Algebra Project. In his recent book *Radical Equations: Civil Rights from Mississippi to the Algebra Project*, Moses (2001) writes,

Today, I want to argue, the most urgent social issue affecting poor people and people of color is economic access. In today’s world, economic access and full citizenship depends crucially on math and science literacy. I believe that the absence of math literacy in urban and rural communities throughout this country is an issue as urgent as the lack of registered Black voters in Mississippi was in 196 . . . . I know how strange it can sound to say that math literacy—and algebra in particular—is the key to the future of disenfranchised communities, but that’s what I think, and believe with all of my heart.

(Moses & Cobb, 2001, p. 5)

I believe that as a field of study, mathematics holds the power to be the great promoter of problem solving, efficacy, and equity. The National Council of Teachers of Mathematics (NCTM, 2000) calls for all math teachers to know: 1) how students’ race, gender, ethnicity, linguistics, and socioeconomic background influence their mathematics learning; and 2) how various cultures have advanced mathematics, the role that mathematics has in culture and society, and the applications of mathematics in other subjects and the relevance in everyday life.

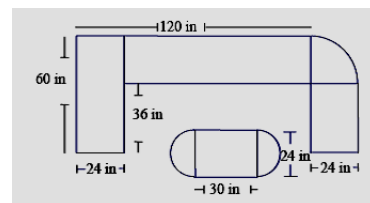
Dr. Moses, the NCTM and TICC have redirected me on the teaching path I need to take. Tatum (2007) and Howard (2006) offer advice on being a better teacher. I am a teacher who, in Howard’s words, is “always in the process of personal and professional transformation (p. 125).” Howard exposit three actions toward transformation: *relationship*, *rigor*, and *responsiveness*. My efforts in all of these areas have been much more focused since reading Howard’s *We Can’t Teach What We Don’t Know*. My relationships with students are burgeoning. I am making better efforts to see, hear and understand my students. I am listening to find out who they are and where they want to go (Tatum, 2007). The powerful message I want to share with students

is: “I believe in you and I will hold both you and myself accountable to honor your capacity to learn. I enjoy being in this work with you (Howard, p. 130).”

Tatum (2006) offers advice for supporting a student’s capacity to learn. Her approach requires that I set high standards. Tatum recommends making the standards for evaluation specific, and placing emphasis on effort. Setting high standards and clear evaluation is already a personal strength. Tatum and Kozol (2006) both mention the philosophy I already espouse, “Think you can—work hard—get smart” (Tatum, 2007, p. 68).

Learning algebra is a process that requires effort; students must recognize that we learn math through effort not by innate ability. In this pursuit of algebra smarts, students will make mistakes. I am following Tatum’s (2007) dictum to “normalize help-seeking behavior” (p. 67). I encourage students to work with classmates, or upper classmen, or parents, or other teachers—anyone who can help them better understand algebra. Multiple perspectives are invaluable in intellectual development. Teaching can be exhausting when I am the only resource in the classroom. If students feel they must wait to speak to me about a math question, valuable class time is wasted as they wait.

These last few weeks I have been working to develop students as resources. I will talk with a student who shows correct work or correct thinking (but maybe an incorrect answer). Then that student becomes an authority on the problem. Let me relate an example from this week. My Integrated Algebra students were working on a problem that required them to find the surface area of a kitchen countertop (a composite shape) in square inches, and then price the cost of the countertop, given that the granite would cost \$14.38 per square foot. I started roaming the class and approached David’s desk. He had written several numbers on the countertop diagram.



I asked him to explain how he had determined each of the numbers he had written. He was correct in his thinking, but he needed prompting to write on his page the thinking he was verbalizing. I invested the time in helping him solidify his thinking on his paper, so that he could become a classroom resource. Then, as other students approached me to help them find the countertop area, I could send them to David for help. This freed me to answer other students' questions.

Haley and Aaron had correctly figured the surface area of the countertop in square inches, but had erroneously calculated the price of the countertop. Their misconception was the conversion of square inches to square feet. I needed to help them see a square foot. With a dry erase marker and a ruler, I had Aaron draw a square foot on his desk. With Haley's help we arrived at the understanding that 144 square inches are in a square foot. Now Haley and Aaron were “conversion factor experts.” I could refer other students to them.

When Sabrina asked how to price the counter top, I told her to see Aaron and Haley and learn to draw a square foot and a square inch, and then call me back over to her desk. I visited with other students for a couple minutes until Sabrina was ready to discuss countertop pricing. She now had a square foot and square inch drawn on her desk, and she knew that one square foot equals 144 square inches. She had correctly found the number of square inches of countertop surface as  $6232.8 \text{ in}^2$ . I said, “Okay, let's use the fact that  $144 \text{ in}^2 = 1 \text{ ft}^2$  to find the number of square feet of countertop.” Sabrina picked up a calculator and multiplied 6232.8 by 144 to get a huge number of square feet. Looking at the number on the calculator screen and the square foot drawn on her desk then looking at me she said, “I think I should have divided.” “Well, do that instead, please,” I responded. This gave her a much more pleasing answer and she explained to me why she needed to divide. I told her I would send students to her desk for help as needed.

As I helped other students I kept an ear open to hear student talk. Hearing Sabrina say to Kaitlin, “First I multiplied the two numbers but that was too big, so I realized I needed to divide and Ms. Riley said that was right” reassured me that students were building confidence in their academic skills and development. This is part of the responsiveness Howard (2006) describes as “our capacity as teachers to know and connect with the actual lived experience, personhood, and learning modalities of the students who are in our classroom” (p. 131).

The third dimension of action, rigor, results naturally from development of relationship and responsiveness. Rigor is ardently pursuing improvement in teaching aptitude, coupled with uncompromised conviction in developing student learning aptitude. Rigor is “caring deeply about our students and about our practice” whoever they are and wherever we are (Howard, 2006, p. 129). Caring deeply about students and my practice, I am always searching for better methods, better strategies, and better ways to engage student, better problems, and better teaching. I get excited by articles or chapters that make claims like Gloria Ladson-Billings (1994) makes in *The Dreamkeepers*,

In this chapter I offer a more contextualized examination of the activities of four classrooms, three in which culturally relevant teaching was practiced and one in which it was not. The context for two of the classes is a reading lesson and for the other class it is a math lesson (Ladson-Billing, 1994, p. 102).

Math lessons! Culturally relevant math lessons, she promises! I read quickly through wonderfully presented reading lessons, only to find that Ladson-Billings (1994) cannot write exactly how a good math lesson looks, sounds, progresses or the topic the lesson is covering. Ladson-Billings describes the lesson as a “whirlwind of activity, perhaps too complex to explain fully here” (p. 119). The entirety of her writing on the math lessons was a let down. In TICC

our readings have made multiple mentions of poor quality math teaching, yet no author can give clear descriptions of high quality math teaching.

I would like to become an expert teacher of algebra. I would like to read about and see expert teachers of algebra. I have taught with several really good algebra teachers, but I have yet to find an extraordinary math teacher. Kozol (2006) has observed hundreds of teachers for his research, and I am comforted that he says those “super-teachers” who are “subject to idolatry in movies and in books from time to time (There aren’t too many teachers like that in the real world, to be truthful)” (p. 293).

I feel better knowing that many teachers are like me—working to be better but not yet “super-teachers.” On the other hand I really would like to have a “super-teacher” mentor. Every day I become a better teacher. Each year I find a few excellent ideas and strategies to add to my teaching repertoire. My TICC course has provided growth opportunities and fodder for greater personal and professional development. The broad topics and writings have served as reminders of previous experiences and as encouragement to refine/revise/revisit my beliefs

### References

- Howard, G. (2006). *We can’t teach what we don’t know: White teachers, multiracial schools, 2<sup>nd</sup> ed.* NY: Teachers College.
- Kozol, J. (2006). *The shame of the nation: The restoration of apartheid schooling in America.* NY: Three Rivers.
- Ladson-Billings, G. (1994). *The dreamkeepers.* San Francisco, CA: Jossey-Bass.
- Moses, B. & Cobb, C. E. (2001). *Radical equations: Math, literacy, and civil rights.* Boston, MA: Beacon.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Reston, VA: Author.

Tatum, B. D. (2007). *Can we talk about race? And other conversations in an era of school resegregation*. Boston, MA: Beacon Press.