

28th Annual AMATYC Conference  
*What Will It Take To Create Equal Opportunity in Math Education?*

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Many educators, politicians, and educational institutions are concerned over the disparities between different ethnic/racial or socioeconomic groups in national and state test scores, attrition rates, enrollment in advanced courses, and degree attainment. One might think that this concern and the considerable resources of the richest country in the world would result in change. But there has been little progress. The 2000 National Assessment of Educational Progress, for example, reports that the large gaps in mathematics scores between Blacks and Whites and Latino and Whites have remained relatively unchanged since 1990. Although our society has made some progress in gaining civil rights for people of color, the difference in educational success—any way you want to measure it—persists.

I believe that the causes of these differences are complex. Certainly how much mathematics a student learns at community college depends upon his/her previous preparation, motivation, feelings (like, dislike, fear etc.) about mathematics, the teacher's understanding of and attitudes toward mathematics and the teacher's attitude toward the students. But it is more complicated than that. The community college classroom is located on a campus with a governing structure, within a community that is situated in a larger society. People in the governing structure, the community, and in the larger society hold beliefs, attitudes, values, and often deep emotions about a variety of issues — teaching, learning, assessment, the nature of mathematics, the nature of schools in a democratic society, race, class, gender, sexual orientation, culture and language — to name a few. In the AMATYC symposium I will pose some questions and offer some thoughts about how some of these beliefs, attitudes, values and emotions affect inequity in mathematics education. These issues are explored in more depth in a booklet "Getting at the Root of the Achievement Gap: Creating Healing Communities to Eliminate Racism," that can be ordered at the NCEE web site <http://ncee.education.ucsb.edu/publications.htm> and an article "inequity in Mathematics Education, Questions for Educators" [Inequity in Mathematics Education: Questions for Educators. *The Mathematics Educator*, 12(2)] available for downloading at <http://ncee.education.ucsb.edu/articlesonline.htm>.

The first question concerns mathematics and culture. Some people say that mathematics is a set of eternal truths that humans discover. Others maintain that it develops from human social interaction — as all other forms of knowledge do.

***Is mathematics culture free?***

The next three questions concern the mathematical problems that students encounter in mathematics classrooms. The distinguished mathematician George Polya (1887 - 1985) wrote "An essential ingredient of the problem is the desire, the will and the resolution to solve it. The problem that you are supposed to do and which you have quite well understood is not yet your problem. It becomes your problem, you really have it when you decide to do it."

***How does a student's culture, class, and gender affect whether the problem becomes her/his problem?***

***How do teachers and curriculum developers present problems that are likely to become the student's problems?***

***How do educators' culture, class, and gender affect their ability to develop and communicate problems so that students desire to solve them?***

If we admit that societal forces affect the mathematics classroom we can ask more pointed questions about race and class.

***How do racial and class bias affect the school experiences of students?***

***How much of the assessment system is driven by (unconscious) race and class bias?***

In regard to this last question, Ubi D'Ambrosio, the Brazilian mathematics educator points out, ". . . mathematics has been used as a barrier to social access, reinforcing the power structure which prevails in the societies. No other subject in school serves so well this purpose of reinforcement of power structure as does mathematics. And the main tool for this negative aspect of mathematics education is evaluation." Many mathematics educators find this statement puzzling. How can evaluation (assessment) be used as a barrier to social access? Consider the following:

1. The nature of the instrument may incorporate cultural values and practices — such as being able to respond quickly on timed tests or being good at figuring out how to eliminate answers in multiple choice questions.
2. Previous experiences with being asked questions and riddles and being rewarded for the right response, might be valued in upper-class and middle-class homes more than it is in working class or poverty-stricken homes.
3. The test-taking environment might work to the disadvantage of students from different cultural and class groups by causing different levels of anxiety.

In regard to the third point, social psychologists have shown that the performance of members of nearly any stereotyped group can be negatively affected by manipulating (sometimes very subtly) the conditions of the testing environment (through instructions or questions given to the test-takers) to bring to consciousness or sub-consciousness one's membership in that group.

Racial and class biases are pervasive in this society. The bias can be subtle or blatant, personal or institutionalized, unconscious or conscious. I believe that making progress in eliminating the achievement gap will require making progress on eliminating the effects of racial and class bias in our society and our schools. So my last question is,

***Can we change racist/classist practices in schools and eliminate (or at least alleviate) the effects of racism and classism on students?***

The National Coalition for Equity in Education

<http://ncee.education.ucsb.edu/> has developed a theory and a set of structures and approaches that help educators productively address racial, class, and other forms of bias. I discuss some of these approaches and how mathematics faculty at community colleges can use them.