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R E P R I N T

The EQUITY 2000 Program of the College Board Increasing the Mathematical Skills of the Precollege Student

William Yslas Velez

What goes on in the precollege classroom has great repercussions for the college classroom, yet it is fair to say that most research mathematicians are oblivious of the instruction that goes on in those classrooms. I believe that the majority of research mathematicians have not been in a high school classroom in years; in fact, many have not been in a high school classroom in this country at all, given the number of foreign mathematicians on our faculties. Yet it is our responsibility as university faculty to continue the mathematical education of these students. But the word "continue" seems out of place here, since this word implies some continuity in this educational process. How can there be continuity if we are uninformed as to the methods of instruction of our colleagues in the K-12 community? That question is the rationale for this article.

I am fortunate to be on the National Advisory Committee for the EQUITY 2000 program of the College Board. The goal of this program is to have every high school student complete algebra by ninth grade and geometry by the tenth grade.

In 1993, as a member of this Advisory Committee, I visited an Equity 2000 middle school in

Prince George's County, Maryland, a suburb of Washington, DC. When I entered the classroom, the students were discussing quadratic equations. On the overhead projector, an overhead display was placed for the graphing calculator. The teacher put up a quadratic equation on the board. With almost no coaxing, a student went over to the overhead and produced a graph of the quadratic equation. From the graph one could see that it had two roots. Next the teacher asked for the exact values of the roots. A student went over to the board and applied the quadratic formula to obtain the roots. The teacher then asked for the approximate value of the roots. Without doing any numerical calculations, the students produced a very rough estimate of the radical by producing an integer whose square was close to the value of the radicand. The students now did the arithmetic and produced the approximate decimal values of the roots. The teacher now asked how this computation tied into the graph that was displayed. One of the students "zoomed in" on one of the roots, producing a number that was close to their arithmetic calculations. I was impressed.

Actually two things struck me about this visit. First, I would be thrilled if first-year college students could have done all of this. Second, I was struck by the vitality that was displayed in that classroom. I wondered how these students would feel coming from this setting and having to sit

William Yslas Velez is a director, Southwest Regional Institute in the Mathematical Sciences, Department of Mathematics, University of Arizona, Tucson, AZ 85721. His e-mail address is velez@math.arizona.edu.

in our college classrooms to listen to a lecture and being forced to take a passive role in their education.

The more I work with the K-12 educational system, the more I am struck by the breadth of educational reform that is ongoing, by the audacity and courage that is shown by the K-12 faculty as they struggle to find better ways to reach their students.

The EQUITY 2000 district-wide program is coordinated by the College Board under the direction of Dr. Vinetta Jones. The starting point for this program comes from a very simple observation. Algebra and geometry are the gatekeepers to college. Research has shown that students who do not complete these two courses have a 1-in-60 chance of going on to college. In place of algebra, students take watered-down curricula that serve as dead-end courses. One of the principal outcomes that results when a school system adopts the EQUITY 2000 program is that these dead-end courses are eliminated and replaced by a solid first-year course in algebra. The aim is to have 100 percent of high school students complete algebra by their first year and geometry by their second year.

The EQUITY 2000 program began its operations in 1990. Eventually this program ran at six pilot sites—Fort Worth, TX; Nashville, TN; Milwaukee, WI; San Jose, CA (a consortium of nine school districts); Providence, RI; and Prince George's County, MD—where a total of fourteen school districts were involved and approximately 700 schools, 2,800 mathematics teachers, and 500 guidance counselors participated. To date over 500,000 K-12 students have been affected by the program. Having learned from the experiences at these pilot sites, the EQUITY 2000 program has now reached its dissemination stage and as of July 1996 has been made available to school districts nationwide.

The principal reasons for the success of this program are that it is district-wide and the commitment to excellence in instruction is long-range. EQUITY 2000 recognizes that the entire school system must become integrally involved in the process of change, from the school superintendent to the principals and teachers, guidance counselors, and parents. Based on its experience with the pilot sites, EQUITY 2000 has formulated its dissemination and institutionalization program. The EQUITY 2000 team will work with the school district in the following areas by providing technical assistance in:

1. Designing the curriculum and structure for summer institutes for teachers, counselors, and principals,
2. designing student-enrichment programs, which include Saturday academies for students,

3. assisting districts in the development of parent and community outreach programs,
4. assisting districts as they seek to create data-collection systems that will provide disaggregated student enrollment and achievement data to drive decisions and monitor the reform.

These points clearly indicate that EQUITY 2000 has formulated a program that encompasses the entire school system. Further, this program has already had a very positive impact at the pilot sites. There are more students now passing algebra at the sites than there were students enrolled in algebra before the program was institutionalized. There has also been a marked increase in the number of students taking advanced placement examinations in mathematics.

It is in the best interest of our profession and of our students that we be informed of these programs and that we find a way of taking an active role in some of these initiatives. If you would like to have more detailed information about the EQUITY 2000 program, please contact Dr. Vinetta Jones, College Board, 45 Columbus Avenue, New York, NY 10023-6992; phone 212-713-8268; fax: 212-713-8293.