

What works is work!

High School Reform; Rigor & Relevance – Really?

It's hard to argue against the case of high school reform, especially with a soundbite like *rigor & relevance* to support the initiative. As a math educator for over thirty years, I have watched reforms come and go; the only consistency I see in these reforms is the depth of the curriculum gets watered down while more is added to the teachers' plate. This results in students becoming jacks of all concepts and skills and masters of none.

Packaging is important, results are more important! The people pushing this reform are concerned with the nation's ability to compete globally. They cite the need for students to enroll in a more rigorous curriculum in the mathematical sciences, especially algebra, then they go about supporting their case for this more rigorous and relevant curriculum by spouting statistics that most audiences accept on face value, and grant money flows like water in the northeast.

The new initiative in algebra touts rigor and relevance. I would argue that relevance is being defined as the insertion of non-algebraic topics in an algebra class, such as geometry, probability, and statistics with a vocational flavor. To accomplish this, algebraic topics such as simplifying algebraic fractions or solving fractional equations are being deleted. I believe that kind of reform decreases the rigor of an algebra program.

I support a rigorous algebra curriculum. I also support the idea that students taking algebra be taught algebra, that students taking geometry be taught geometry. You don't increase the rigor of a class or program by eliminating important concepts and skills in the subject and replacing them with unrelated concepts, skills, and applications.

Rather than eliminating algebra concepts, I would suggest that students and the nation would be better served if teachers were trained to make the algebra curriculum more relevant. A typical teacher teaching the conic sections in algebra would teach the students to find the vertex, focus, and directrix of a parabola. That's not very impressive to algebra students. To make it more relevant, teachers should be trained to show students how a paraboloid directs sound and light and how the math they are learning describes experiences they use every day with flashlights, satellite dishes or in venues like the Hollywood Bowl.

In a typical math class, students might be taught the slope and wonder when they will ever use the concept. Again, teachers should be trained so they can make slope more

relevant by talking about the pitch of a roof, the grade of a hill, or just buying cokes at their local convenience store. If one cold drink costs \$0.50, two cost \$1.00, three cost \$1.50. the change in price for each additional cold drink is \$0.50, the *rate of change* is \$0.50; the slope is \$0.50.

Students should be taught the trig identity, $\cos^2x + \sin^2x = 1$, the equation of a circle, the distance formula, and the Pythagorean Theorem are all the same equations– just written differently because they are being used in different contexts. These kinds of linkages allow teachers to introduce new concepts and skills in familiar language, teachers have an opportunity to review and reinforce previous learning or connect to outside experiences, to compare and contrast, as well as seeing the math used in different contexts.

The current system is not working because we have a well-documented shortage of math and science teachers. Watering down what those teachers teach will not solve the problem because you still have the same workforce.

Yes, it is hard to argue against rigor and relevance. It is very difficult to go against a popular view supported by concerned and sometimes rich and powerful organizations, their success in recruiting people into their movement results in more success in funding their proposals. But as policymakers, you know better than most the devil is in the details.

Secondary schools do need a wake-up call. They need to adopt, implement, and follow through with rigorous and relevant curriculums. Site administrators must give their teachers more timely feedback regarding classroom performance. They need to provide meaningful suggestions, recommendations and directions to classroom teachers to improve instruction that will result in increased student achievement.

Increased student achievement will not become a reality by eliminating algebraic concepts and skills and inserting concepts and skills that are not described in the title of the class. That certainly will not make us competitive in a global market if algebra skills and reasoning are needed.

Simply stated, students cannot learn what they have not been taught. Teachers cannot teach what they do not know.

As you are asked to support high school reform, please ask for a definition of *rigor and relevance*, and make sure the reformers' definition aligns with your understanding. Student achievement will not increase by lowering the ceiling to raise the floor.