

Let me try to answer your questions.

I became involved with Where's the Math and Parents for Math Matters (Spokane) about 1 ½ years ago. It started when I spoke at the Lakeside High School Board Meeting. A concerned parent and teacher asked if I would speak and ask the board to consider keeping traditional math. The school was in the process of switching to Core Plus (a reformed program) in the High School after having switched to Connected Math (another reformed program) in the Middle School. Once my name got out there, I was contacted by other groups and have spoken to several school boards, senators and representatives, and administrators.

I first became concerned about some of the new math programs when I taught at Blue Mountain Community College in Pendleton, Oregon from 1998-2000. Most of the students I saw came from the Integrated Math program at the local high school. Their lack of basic skills in arithmetic and algebra was alarming to me. Students were extremely dependent on their TI graphing calculators and could not graph even basic functions, solve equations, or do simple computations without their calculators. It was such a problem that I stopped allowing calculators in my pre-calculus and calculus courses.

At Gonzaga, I have continued to see students who have come from various reform programs struggle with basic skills. My students often complain that they never learned their times tables and say that they should not have been allowed to use calculators in grade school. They do see the damage that has been done. Many programs, such as Investigations (TERC) do not even cover topics such as long division and routine computations with fractions. By the time these students come to college, they are unable to go into technical majors and have to struggle to pass even elementary math classes designed for non-technical majors. By the time the students hit college, the problems and gaps cannot easily be fixed with one or two "refresher" courses. There are often gaps and holes in their mathematics background that would require years of remediation to fix. For most students, that is not a reasonable option. Therefore, instead, they opt for non-technical majors. We are faced with a 20% decline nationally in the number of engineering majors in recent years. It is devastating.

It is clear that these programs are not preparing students for college level mathematics. At Blue Mountain Community College, I had one student who stood out from the others. I asked her what her background was since she clearly had not gone to the local high school. Her algebra and arithmetic skills were outstanding. She informed me that she had come from a poor village in Mexico and they could not afford calculators. She had done all of her work with pencil and paper and she was heads and shoulders above the local student in my class. She was clearly outperforming students that had had "honor's" integrated math at the local high school. Back then, I knew there were major flaws with the reform programs.

Singapore also has figured out the importance of pencil and paper skills in their internationally successful mathematics curriculum. It is clear, concise, non-ambiguous, and provides students with a solid mathematics foundation. Calculators are introduced later and only when appropriate (i.e. not for basic skills).

I have seen many college students who have taken four years of honors reformed math in their US high school to be placed into basic college algebra. Instead of taking calculus, they struggle with basic skills. They thought by taking the best math offered at their high schools they were preparing themselves for college. They are angry when they realize that they are not prepared for college and are unable to major in technical fields. They feel duped. That is one reason I continue to speak out despite backlash from local administrators. I think the students, teachers, and parents need to be heard.

This summer, a colleague of mine is teaching college algebra at Gonzaga. He decided not to allow calculators. His students asked how they were going to multiply without them. He had to give times tables so they could learn their basic multiplication facts----something that used to be taught in 3<sup>rd</sup> grade.

I hope that helps paint a picture of the damage that has been done with these programs. What kind of future does a college student have if they haven't learned times tables, long division, or how to work with fractions and decimals? Business, science, nursing, computer science, mathematics, social sciences, etc. are all off the table. Please keep getting this message out. The problem is that it often takes students years to realize there is a problem because they assume (as do most parents) that they are getting what they need in school. If more parents and students really knew what was going on, there would be more outrage. I commend the local groups who are speaking out on this crucial issue.

This does not just hurt kids going to college. I went to an art festival yesterday and the young man working at the lemonade stand could not figure out the correct change when I gave him a \$20 for a \$5.50 purchase. I notice that most people in their 30's and older don't seem to have problems doing this type of arithmetic in their heads. Students who are handed a calculator in first grade do have problems with this kind of basic math. This lack of skill will hurt them in trips to the grocery store and everyday aspects of their lives. That, to me is even more tragic than the loss of technical majors. We are raising a generation of mathematically illiterate kids. The irony is that the claim of these reform programs is that they make math more accessible. The problem is that in watering down the math, they have removed all rich mathematical content, the practice of standard skills and algorithms, and the foundation for later study of advanced mathematics. The kids can get "A's" in this reformed math, but they come out with no skills and no deep understanding (again, something the new programs claim to promote).

Two things need to happen. All kids need basic skills in elementary school. There are pencil and paper math skills using standard algorithms. No calculators should be used at this age. These skills should include knowing times tables (up to at least  $10 \times 10$ ) and being able to do long division, multi-digit addition, subtraction, and multiplication as well as reduce, add, subtract, multiply, and divide fractions. Students should be able to simplify square roots and factor numbers into primes. They should be able to find common denominators, multiples of integers, and convert between fractions and decimals. These should all be done with great proficiency and accuracy.

Second, those students with potential in mathematics have to be given opportunities to succeed and develop this potential. The current trend of one "math for the masses" hurts all students at all levels. Students need to be allowed to excel in mathematics. Middle schools need to provide real algebra courses and high schools need to have quality courses in algebra, trig, geometry, pre-calculus, and calculus. They should not be watered down (something, which has happened because kids coming in to the high school programs are lacking basic skills). They need to be rigorous and challenging. It is crucial that we do the best for all of our students and ensure that "No Child Left Behind" does not become "No Child Allowed to Excel".

Thank you for your time,

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