

# What kind of math do most of us need? The most basic kind

BY FRANK ROTERING, SPECIAL TO THE SUN MARCH 25, 2009

Mathematics is a beautiful and powerful tool, as Dr. Arvind Gupta has recently stated in the Vancouver Sun series, Math Matters. It is also highly abstract, which makes it difficult for many students to grasp. Capturing the beauty and power of mathematics while being sensitive to student struggles calls for careful thought on the part of educators. Getting it wrong could mean undue stress and frustration for students, discouraging them from entering fields where they could make solid contributions. It could also mean that parents are forced to hire tutors they can't afford, especially during a severe economic downturn.

However, I have some concerns with this series. One problem is that a clear distinction is not made between numeracy and higher mathematics. There is little doubt that all students should be numerate. To function intelligently in today's society and to appreciate the world they inhabit, students need arithmetic, basic algebra, and basic geometry. The real question is who should go further in mathematics.

If a student is headed for a career in science, engineering, or related subjects, higher mathematics is clearly a necessity. For other careers, however, this need should be vigorously questioned. According to a retired U.S. educator, higher mathematics is not required for "bankers, teachers, nurses, doctors, musicians, real estate salesmen, clerks, longshoremen, truck drivers, carpenters, painters, architects, firemen, policemen, warehousemen, gardeners, laborers, maids, restaurant workers, journalists, diplomats, Wal-Mart CEOs, or even school board members."

According to a science professor, only five per cent of jobs in the United States in the 2000s might require higher math." These comments are consistent with my own experience. I spent 25 years in the computer industry teaching courses on databases, communications, performance, and programming. Performance in particular is highly quantitative, but all I ever needed was a calculator and the algebra to handle spreadsheets. The same was true for my students, all of whom held highly technical jobs. An academic study underscores the point: "Although completion of courses in mathematical topics beyond elementary arithmetic serves as one of the most significant factors for job entry and advancement, those topics are rarely used by the majority of computer professionals." In the online discussion of Dr. Gupta's initial article, several people said that higher mathematics teaches students logical thinking. The objective here is admirable, but it is far from obvious that mathematics is the best way to achieve it. My high school geometry teacher admitted that chess might be more effective than math for this purpose.

Another problem with the thinking behind the series is Dr. Gupta's claim that "the world is demanding more and more quantitative skills in individuals." Is this true? The current economic crisis can in part be traced to the complex manipulation of financial instruments by Wall Street mathematicians -- the so-called "quants." Do we really need more of these folks?

The importance of getting mathematics instruction right is best illustrated with an anecdote. A few years ago I was talking to a hairdresser while getting a haircut. She told me her son had just graduated from BCIT as a tool-and-die maker. I said that was great, but she was quite distressed about it. He originally wanted to be a mechanic, but because his math wasn't good enough he had to settle for his second choice.

What can we learn from this? Only solid numeracy is needed for mechanics, so it appears that an artificial math requirement stopped this person from meeting his goal. Quite possibly, the world now has an unhappy tool-and-die maker where it could have had a happy mechanic. This is a tragedy -- one that could have been prevented by clear thinking about the proper role of mathematics in the workplace and the classroom.

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