

## **Response to Letter from K. Burningham and P. Harrington**

My two recent public reports to the Utah Legislature seem to be the main topic of concern to Burningham and Harrington in their letter, dated August 24, 2007. Unfortunately, they seem to misunderstand what it was I was concerned with and why I chose to compare the new Utah Mathematics Standards with those of Singapore.

In my first letter, what I was chiefly objecting to was the fact that these so called world class mathematics standards that Utah just adopted are filled with MAJOR MATHEMATICAL ERRORS. I went to considerable lengths to list JUST SOME OF THEM IN THE SIXTH AND SEVENTH GRADE STANDARDS. There are many more in these grades and even more in grades 2 - 5.

So one could paraphrase my main objection as pointing out the fact that these standards are functionally MATHEMATICALLY ILLITERATE! As things stand, I would fully expect these new Utah Math Standards to receive an F in the next cycle of ratings by the Fordham Foundation since major mathematical errors are disqualifying.

People then asked me if I could show explicitly why I said that the Utah math standards were at least two years below international expectations by the end of seventh grade. I did this in my second letter by taking the Singapore Standards - they are relatively representative of those of the high achieving countries, somewhat less challenging than those of Russia, Hungary, Poland, but very comparable to those of China and Japan - and comparing the fifth grade Singapore expectations with the seventh grade expectations in Utah.

As to the spurious argument in the Burningham-Harrington letter that Singapore does not have any Nobel Prize winners, I would first suggest that (1) Singapore is both a very small country and (2) a very new country. In fact, it was a British colony from 1867 - 1942, and only fully self-governing since 1955. Realistically, their current education system and its results can't be said to be much more than 40 years old, if that, and people tend to win the Nobel Prize only late in their lives. The modern infrastructure in Singapore is even more recent. It is hard to believe that Burningham and Harrington were not aware of these facts.

More important, the core observation by Burningham and Harrington that

"Singapore has yet to produce a single Nobel Prize laureate. Denmark and Norway, countries of roughly similar size, have produced 14 and 10 respectively. By the way, the United States scored a 504 in the 2003 TIMMS test, well above the international average of 466. As noted earlier, Singapore led the world with a score of 605. Norway, the country with 10 more Nobel Laureates than Singapore, scored 461,"

is beside the point. In fact, it reflects exactly the elitist attitude that is at the heart of the current problem. Nobel Prizes are something only the most brilliant achievers win. These people are, by any standards, the intellectual elite in any country. If - as was the case until very recently in countries like Denmark, Norway, Germany and, unfortunately, even the United States - the objective of the public education system was to give a minimal education to average citizens, but a first rate education to the top five or ten percent, then counting Nobel Prize winners is entirely appropriate.

However, today the problem is that the education we give to the vast mass of our population is not adequate to allow them to compete in the workplace with the mass of people from the high achieving

countries such as Singapore, China, Japan, Poland, Russia and probably India. The TIMSS results that Burningham and Harrington quote above are measures of ALL THE STUDENTS in Singapore, Denmark, and Norway. The fact that Denmark and Norway scored in our range simply reflects the fact that the vast mass of students in Denmark and Norway were educated to the level of our average students, and we know this is not sufficient.

Additionally, it is worth noting that the last time our top students were compared with the top students from other countries was in 1995. At that time our top students scored even worse relative to the top students in the high achieving countries than did our average students relative to their average students.

There will again be an international test of advanced students in 2009. However, when our country was invited to participate, both the U.S. Department of Education and the National Science Foundation, for the first time, refused to allocate funding. The most likely explanation for this extraordinary event is that, at the highest levels in our government, our leaders are afraid of what the comparison will show.

R. James Milgram  
Professor of Mathematics,  
Stanford University

Member: National Board for Education Science, the Presidential Board that oversees the research arm of the U.S. Department of Education,  
Member: NASA Advisory Council (the first and so far only mathematician to be accorded this singular honor),  
Member: Both the National and International Advisory Boards on TEDS-M, the international study of teacher preparation that will take place in 2009.  
Member: Advisory board National Council on Teacher Quality.  
Member: Achieve Mathematics Advisory Panel  
as well as other Advisory Boards  
Main reviewer and/or outside mathematics advisor for current Massachusetts Mathematics Standards, New York High School Mathematics Standards, Georgia Mathematics Standards, NCTM Focal Points.