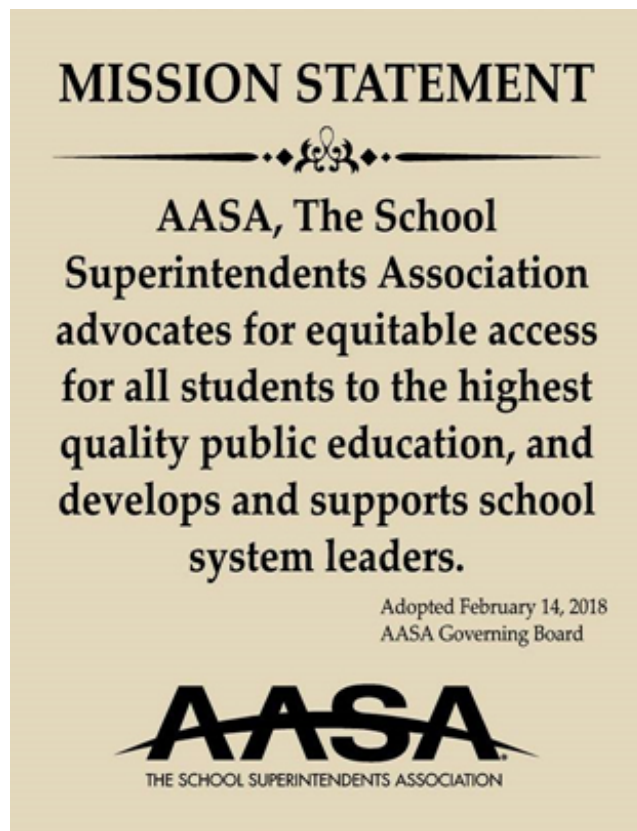


An Inside Look at Singapore Math With American Eyes

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Spotlight by Robert L. Gross

In 1999, after serving the public schools in Minnesota for 35 years as a teacher, principal and superintendent, I left for Singapore to assume the superintendency at the Singapore American School. I was armed with two facts about Singapore: (1) A student at Singapore American School had been caned by the Singapore authorities in 1994 for vandalizing cars; and (2) The math scores in Singapore consistently ranked at or near the top in international assessments.

Eight years later when I left Singapore to return to the United States, I had a far greater understanding of how that strength in math is achieved and at least a vague understanding of how a student gets into a position where caning is a likely outcome. I also had learned the math results were achieved in un-air-conditioned classrooms with up to 44 students per class. Singapore is 90 miles north of the equator, and the daily year-round temperature hovers between 88 and 92 degrees. Humidity is always high.



To be clear, Singapore American School is a school with 3,800 students from 54 different countries. The number of Singaporean students attending the school is about 4 percent.

The international assessments that consistently rank Singapore in the top tier of countries on math results reflect achievement scores from the local government schools in Singapore and do not include either Singapore American School or the other international schools operating in Singapore. So, if class sizes and physical environment aren't the magic factors behind high scores, what are? And how might Singapore's academic results be replicated elsewhere?

Three answers are found in the attitudes of Singaporean society at large, in the specific actions of Singaporean parents and in the approach taken by the Singapore Ministry of Education.

Unwavering Support

I had not been living in Singapore long before I noticed that The Straits Times, Singapore's English-language daily newspaper, never published disparaging remarks about teachers or schools. Local citizens carried an almost reverent view of educators. This reverence was apparent in reading Singaporean publications but also in visiting with local residents.

Many people in Singapore share a strong belief that a good education is necessary to achieve a higher standard of living and to improve one's quality of life. A significant part of the equation in improving one's circumstances is a belief that students must excel in mathematics.

Singapore is a city-state of 4.5 million people with a mandatory national curriculum in all government schools. The curriculum has a strong emphasis on science and math and is designed for depth rather than breadth.

In the United States, the debate continues over the merits of adopting national curriculum

standards. Some here argue that without adoption of national standards in mathematics and relatively strict adherence to the standards, the United States probably will never find itself in the upper rankings of international math assessments.

Singapore leaves nothing to chance when it comes to the design and implementation of its national math curriculum. It is well-defined and accompanied with the professional development needed to keep all teachers well-informed of the content and the appropriate methodology to achieve the desired results.

Remediation Expected

Complementing the strong and unified national curriculum is the strong desire of Singaporean parents to have their children do well in mathematics. An underlying belief among Singaporean parents is that doing well in math, perhaps more than any other subject, will lead to a better-paying job. A high percentage of parents hire math tutors to ensure their children perform well in mathematics. Even parents of modest means will stretch the family budget to hire math tutors.

In addition, the pace and rigor of the math curriculum is such that many students probably could not keep up without the support of tutors. Saturday sessions are common practice in many Singaporean households. An additional incentive for both parents and students is that school placement depends somewhat on student scores in locally designed and administered achievement tests.

I was amazed at how readily parents accepted the need to hire a math tutor rather than criticize the teachers or the school for not providing the full support their children needed to do well on the math assessments. The mindset seems to be if there is any blame to be leveled for poor academic performance, it is placed on the individual student and not on the program or the teachers.

A small percentage of Singaporean parents prefers to remove their children from the local government schools because their children don't cope well with the rigor of the curriculum. It needs to be noted that the curriculum is also rigorous in science and languages. The mode of instruction is in English. Chinese, Malay and Tamil are taken as foreign languages, and each student is required to take at least one of those.

In an environment where there is curricular coherence, curricular rigor and curricular focus, the stage is set for impressive math results. When that is complemented with a deep belief throughout society that doing well in mathematics is central to getting a prestigious and well-paying job and math tutors are an integral part of the equation, it is not surprising to learn Singapore is continually at or near the top on international math assessments.

Matching Zeal

While Singapore Ministry of Education officials take pride in the country's assessment results, they also recognize the need to infuse the math curriculum with more standards that emphasize critical thinking skills. This presents a major challenge because changing current teaching practices requires adjustment of the teaching methodologies at the major university that prepares teacher candidates and changes in the in-house professional development that teachers receive throughout their careers.

In the May-June 2008 issue of Foreign Affairs, Fareed Zakaria quoted Tharman Shanmugaratnam, who until recently was Singapore's minister of education, as saying, "We both have meritocracies (Singapore and the United States); yours is a talent meritocracy, ours is an exam meritocracy. We know how to train people to take exams. You know how to use people's talents to the fullest. Both are important, but there are some parts of the intellect that we are not able to test well, like creativity, curiosity, a sense of adventure, ambition. Most of all, America has a culture of learning that challenges conventional wisdom, even if it means challenging authority."

It is difficult (and it may not even be desirable) to imagine families in the United States approaching the acquisition of mathematics skills with the zeal typically found in Singapore. However, by continuing to examine our own approach to the teaching of math and by studying curriculum and teaching practices of other countries, we can ensure greater success in moving our students along the continuum.

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