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Can Innovation Thrive in Singapore?

Posted By [admin](#) On April 23, 2010 @ 7:10 AM In [Making Minds Matter](#) | [Comments Disabled](#)

I recently traveled to Singapore to research their national education system. During my visit, I stopped by the campuses of the National University of Singapore (NUS) and the National Institute of Education (NIE)—Singapore's only teacher-training institute—to talk to professors, administrators, and students.

According to the Times Higher Education-QS World University Rankings 2009, both universities rank in the global top 100. NUS is ranked 30th in the world. NIE is an autonomous institute of Nanyang Technological University, which is ranked 73rd in the world.

Singapore students are among the best in the world at math according to the results of the Trends in International Mathematics and Science Study (TIMSS).

First administered in 1995, the TIMSS has assessed the science and math performance of fourth- and eighth-grade students from several countries every four years.



Bill Costello visits the National Institute of Education.

In 1995, 1999, and 2003, Singapore students in both grades were in first place in math. In 2007, Singapore fourth graders were in second place and eighth graders were in third place. Fifty-nine countries participate in the 2007 TIMSS.

The math textbooks and workbooks used in Singapore have produced the best results in the world. Titled "Primary Mathematics," but often referred to as "Singapore Math," the book series is based on the national math curriculum of Singapore.

The focus of Singapore Math is on depth, rather than breadth; a few important concepts are covered in great depth so that students can master them. In contrast, the focus of the math curriculum in the U.S. is on breadth.

Singapore Math differs from the way math has been traditionally taught in the U.S. in several ways. Instead of teaching students how to apply formulas, Singapore Math teaches students different ways to solve problems. Rather than using paper and pencil, problems are often solved mentally. Rote memorization is replaced with understanding the "why" behind each concept. Concepts are taught once, not repeated year after year. Worksheets have no instructions so that students learn concepts in school rather than at home.

Because of the success of Singapore Math, many schools and homeschool parents in the U.S. have adopted the method.

Even with all their success in math, Singaporean educators are not content with their education system. Three years ago, the "Washington Post" published an article titled "Asian Educators Looking to Loudon for an Edge." The article was about educators from Singapore who visited classrooms in the U.S. to learn how to teach students to think more creatively. Apparently, the U.S. is admired by Singaporeans for its ability to produce scientific and technological innovations.

Even though American students do not score nearly as well as Singaporean students in math, they tend to be more innovative. The latter skill is more important than the former in our increasingly globalized world where moving up the value chain means transforming from an industrial-based economy to a knowledge-based economy to an innovation-based economy.

This is not to say that knowledge in math is not important, because it is. However, knowledge alone is not enough. It must be combined with the ability to apply knowledge in new ways.

Applying knowledge in new ways is how innovation occurs, and innovation is critical to any nation's economic and national security.

Perhaps American students tend to be more innovative than Singaporean students because the societies in which they live are different. Americans enjoy much more freedom of thought than Singaporeans, and freedom of thought engenders a state of mind conducive to innovation.



Bill Costello visits the National University of Singapore.

In Singapore, freedom of thought is discouraged by the limitations posed on freedom of expression. For example, the Singaporean government severely restricts public speeches and censors the media.

Education systems do not operate in a vacuum; they are influenced by the societies they serve.

If Singaporean educators want to learn how to teach students to think more creatively so the nation can increase its ability to produce scientific and technological innovations, then it would be useful for them to look beyond the classroom.

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Article printed from BorneoPost Online | Borneo , Malaysia, Sarawak Daily News: <http://www.theborneopost.com>

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