

Going Beyond Singapore Math: Resisting Quick Fixes

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Editor's Note: Bill Jackson, Math teacher, Scarsdale, NY public schools, shares his global journeys investigating math education from Singapore to Japan and back again to the United States in an original series for The Daily Riff, [Singapore Math Demystified!](#), (see links below). His posts have become classics in the Singapore Math lexicon, as well as professional development for math teachers and curriculum, offering us a unique hands-on perspective into our global community.

- C.J. Westerberg

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-Bill Jackson

Going Beyond Singapore Math

By Bill Jackson

Singapore math is becoming increasingly popular in the U.S. because of its focused and coherent textbooks, its powerful problem solving methods, and its emphasis on conceptual understanding and in-depth learning of important mathematical topics. A [recent article](#) in the Washington Post, however, outlines the challenges one inner city D.C. school is facing in their adoption of Singapore math, and suggests that it may be too difficult to implement, or that it may work in Singapore, but cannot be transplanted to the U.S.

I have used Singapore math successfully in inner city and suburban settings and I know that in both

settings it can improve the teaching and learning of mathematics. It is naive, however, to think that success comes by just adopting Singapore math. There are complex issues behind making a program like Singapore math work in an American setting.

Singapore math, or good math teaching?

U.S. educators became interested in Singaporean materials and teaching methods because of the outstanding performance of Singaporean students on international mathematics assessments such as Trends in International Math ([TIMSS](#)). The phrase "Singapore math" was coined in America as schools began using [Primary Mathematics](#), the math program that helped propel Singapore to the top of the world. In Singapore, however, most people don't even know what Singapore math is. To them it's just math (or "maths," as they call it). Singapore's textbooks and math programs are definitely among the best in the world but they are not the only reason Singaporean students do well in mathematics. (See my series [Singapore: Five Surprises in Education](#) on The Daily Riff to learn more.) Other East Asian nations such as Japan and Korea have similarly good textbooks and also do well in mathematics. What are these countries doing that makes them so good?

In my experience, I have found three main reasons: focused curriculum and textbooks, well-trained and knowledgeable teachers who are provided ample professional learning opportunities throughout their careers, and societies that value education. I have written extensively about these ideas in previous posts but I would like to address them the context of American schooling lest those who embark on this journey lose hope and turn back before real progress can be seen.

Focused curriculum and textbooks

If a school adopts Singapore math, they have adopted some of the best materials and teaching methods in the world. Of course, these materials are designed to address Singapore's national standards, not America's. In fact, America doesn't even have national standards. Each state (and the District of Columbia) has their own standards and they are all different. Take the following example from the **third** grade D.C. standards:

Know the meaning of 0.75, 0.50, and 0.25 as they relate to money; know that fractions and decimals are two different representations of the same concept.

Although children begin learning about money in Singapore math in first grade, decimals and their relationship to fractions are not introduced until grade **four**. There is a good reason for this. ***Until grade 4, Singapore math focuses mostly on the fundamental concepts needed to understand decimals, namely place value, whole number operations, number sense and mental math.*** It is possible, then, that a D.C. student could be learning Singapore math well but miss an item like this on a test simply because he or she never learned this concept. The District of Columbia and all but eight states have recently adopted the Common Core State Standards ([CCSS](#)). The CCSS are partially based on Singaporean math standards and it's no coincidence that like Singapore, they introduce decimals in grade four.

The reason why the U.S. is moving towards national standards is precisely because of the success of countries like Singapore that have focused national standards. It's a waste of time for schools to focus on preparing students to pass the current slate of state tests because they are based on poorly constructed standards, and do not adequately measure the math that kids should really be learning. As new tests are developed for states that adopt the CCSS, state assessments should improve and become more closely aligned with what is taught in Singapore math, and students

should do better. In fact, D.C. has already joined with 26 other states to create the Partnership for the Assessment of Readiness for College and Careers ([PARCC](#)), which is developing such tests for the 2014-2015 school year.

Well-trained and knowledgeable teachers

In order to teach Singapore math effectively, teachers need to be well trained and competent in mathematics. In Singapore all teachers are trained at the same teacher training institution, the National Institute of Education (NIE). At the NIE, all Singaporean teachers receive top-notch training in mathematics (you can learn more about the NIE in "[The Creativity Initiative in Singapore](#)"). The training of Singaporean teachers does not end after they graduate from the NIE, however. When they begin their teaching careers they receive extensive help from mentor teachers and throughout their careers they are provided many opportunities to work collaboratively, grow and improve their teaching. They progress along career tracks that can lead to supervisory and other positions of leadership, and they receive feedback from multiple stakeholders, including administrators, colleagues, parents and students, as they progress through these tracks (you can read more about this in "[The Professional Lives of Teachers in Singapore](#)").

In the U.S., teachers are trained at a variety of colleges and universities that have varying requirements and degrees of rigor and that focus significantly less on mathematics teaching and learning than the NIE. Ongoing professional development of teachers is often sporadic, disconnected and discontinued. What ongoing professional training U.S. teachers do receive is often narrowly focused on helping students to pass standardized tests, not the real issues behind mathematical learning. This is not to say that there are not excellent and knowledgeable teachers in the U.S., only that U.S. teachers generally have fewer opportunities to grow.

For U.S. schools implementing Singapore math it is especially important to have a structure for systematic, ongoing professional learning for teachers. There has been a movement in the U.S. recently to develop professional learning communities and engage in collaborative learning processes such as [lesson study](#) where teachers work together to plan, teach and observe classroom lessons. Collaborative professional learning opportunities such as lesson study, however, produce gradual improvement in teachers over time. In the U.S., we don't seem to have the patience for this kind of long-term professional learning and many schools that have adopted such practices have abandoned them in one or a few years because they didn't improve test scores right away.

In order to address this problem, I believe that teachers and schools should resist the pressure to find quick fixes to poor math performance. This is especially true in the inner cities where pressures to improve test scores quickly are the greatest. We would be better served to look at improvement in the teaching and learning of mathematics as a marathon, not a sprint, and put in place the long-term structures that lead to slow but steady improvement.

A society that values education

In Singapore, education is society's most important mission because they have no natural resources and depend entirely on human capital. Schools are clean, bright, and well supplied, teachers are highly respected and well paid, and the government invests billions of dollars in improving education (read more about this [here](#).) Parents also invest highly in the education of their children and it is common for parents to buy supplementary math materials to study at home and pay for after school [tutoring](#).

The reality in the U.S. is quite different, especially in the inner cities. Schools are often dilapidated and ill-equipped, teachers are often maligned, and parents are sometimes uninvolved or unable to

help with their children's education. This problem is arguably the hardest to fix because it depends on factors that are largely beyond the control of the local school. Schools can help, however, by providing parent workshops, after school homework help, and additional in-school instructional time with the best teachers for students who are struggling.

Conclusion

Singapore math is a great first step towards improving the teaching and learning of mathematics, but it is not a silver bullet to solve all of the complex issues involved in improving the teaching and learning of mathematics. In order to be truly successful, we need to go beyond the simplistic notion that a math program alone is enough to create positive, lasting change. Other factors need to be addressed, such as providing teachers with frequent opportunities for high quality training and providing substantial parental and student support. If we carefully address these issues we can succeed. But if we keep throwing out promising ideas just because they don't immediately improve scores on tests whose quality is questionable at best we're doomed to repeating the haphazard and fragmented reform efforts that got us here in the first place.

For schools that are using Singapore math, I would like to say that you are definitely moving in the right direction. There will be challenges along the way but they are the same ones you would face with any math program and they can be overcome if you understand the bigger issues behind effective math teaching and learning.

And as you plod forward in your Singapore math journey, remember the words of Winston Churchill, "Never give in. Never give in. Never, never, never, never - in nothing, great or small, large or petty - never give in, except to convictions of honour and good sense."