What Works Clearinghouse

INSTITUTE OF EDUCATION SCIENCES

Middle School Math April 2009

Singapore Math

Effectiveness[1]

No studies of *Singapore Math* that fall within the scope of the Middle School Math review protocol meet What Works Clearinghouse (WWC) evidence standards. The lack of studies meeting WWC evidence standards means that, at this time, the WWC is unable to draw any conclusions based on research about the effectiveness or ineffectiveness of *Singapore Math*.

Program Description[2]

Singapore Math is a collection of math curricula originally developed by Singapore's Ministry of Education and private textbook publishers for use in Singapore schools.[3] *Singapore Math* curricula were developed under a national framework centered on problem solving that emphasizes computational skills as well as conceptual and strategic thinking processes. Compared to many U.S. textbooks, *Singapore Math* textbooks, particularly those intended for earlier grades, tend to provide more in-depth coverage of a relatively small number of topics. Curricula for the secondary level (for the *Singapore Math* collection of curricula, grades 7–10) follow a more integrated approach, where concepts and examples from algebra and geometry are introduced progressively at each grade level. *Singapore Math* textbooks emphasize problem-based development of mathematical concepts and use concrete illustrations to show how to solve multistep problems. The content framework covers topics in increasingly advanced detail in successive grades. There are several textbook options for students in the middle school grades. According to

The WWC identified 12 studies of *Singapore Math* that were published or released between 1983 and 2008.

Six studies are out of the scope of the review protocol because they have an ineligible design.

- Three studies have designs—such as a meta-analysis or research literature review—that are not primary analyses of the effectiveness of the intervention.
- Two studies do not use a comparison group.
- One study does not include enough information about its design to assess whether it was eligible for the review.

Six studies are out of the scope of the review protocol for reasons other than study design.

- Four studies do not examine outcomes within a domain specified in the protocol.
- Two studies do not examine the effectiveness of an intervention.

1. The studies in this report were reviewed using WWC Evidence Standards, Version 1.0 (see the WWC Standards).
2. The descriptive information for this program was obtained from publicly available sources: the program's website (http://www.singaporemath.com, downloaded December 2008), a Singapore distributor's website (http://www.sgbox.com/singaporemaths.html, downloaded March 2009), and Ginsburg et. al. (2005). The WWC requests developers to review the program description sections for accuracy from their perspective. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review.
3. In Singapore, math instruction is conducted in English.

Program Description[2] *(continued)*

the United States distributor, the majority of U.S. middle schools using *Singapore Math* curricula use the New Elementary Mathematics series for grades 7–10.[4] Other series for grades 7–10 include New Syllabus Mathematics, Discovering Mathematics, and New Mathematics Counts; some U.S. middle schools also use one of several Primary Mathematics series designed for grades 1–6. Each of the curricula intended for grades 7–10 incorporate algebra, geometry, and introductory trigonometry.[5]

References

Studies that fall outside the Middle School Math review protocol or do not meet evidence standards

Adams, L. M., Tung, K. K., Warfield, V. M., Knaub, K., Yong, D., & Mudavanhu, B. (2002). *Middle school mathematics comparisons for* Singapore Mathematics*, Connected Mathematics Program, and Mathematics in Context (including comparisons with the NCTM Principles and Standards 2000)*. Retrieved from University of Washington, Department of Applied Mathematics website: http://www.amath.washington.edu/~adams/full.pdf. The study is ineligible for review because it does not include an outcome within a domain specified in the protocol.

Desimone, L., Smith, T., Baker, D., & Ueno, K. (2006). Assessing barriers to the reform of United States mathematics instruction from an international perspective. *American Educational Research Journal, 42*(3), 501–535. The study is ineligible for review because it does not include an outcome within a domain specified in the protocol.

Ezarik, M. (2005). Lessons to learn: U.S. vs. Singapore math. *District Administration, 41*(5), 70. The study is ineligible for review because it is not a primary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Fan, L., & Zhu, Y. (2007). From convergence to divergence: The development of mathematical problem solving in research, curriculum, and classroom practice in Singapore. *ZDM—The International Journal on Mathematics Education, 39*(5), 491–501. The study is ineligible for review because it does not include an outcome within a domain specified in the protocol.

Garelick, B. (2006). A tale of two countries and one school district. *Third Education Group Review/Essays, 2*(8). Retrieved April 22, 2008 from: http://www.thirdeducationgroup.org/Review/Essays/v2n8.pdf. The study is ineligible for review because it is not a primary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Garelick, B. (2006). Miracle Math. *Education Next, 6*(4). The study is ineligible for review because it does not examine the effectiveness of an intervention.

Ginsburg, A., Leinwand, S., Anstrom, T., & Pollock, E. (2005). *What the United States can learn from Singapore's world-class mathematics system (and what Singapore can learn from the United States): An exploratory study.* Washington, DC: American Institutes for Research. The study is ineligible for review because it does not use a comparison group.

Ho, K. F., & Hedberg, J. G. (2005). Teachers' pedagogies and their impact on students' mathematical problem solving. *Journal of Mathematical Behavior, 24*(3–4), 238–252. The study is ineligible for review because it does not use a comparison group.

Hoven, J., & Garelick, B. (2007). *Singapore Math*: Simple or complex? *Educational Leadership, 65*(3). The study is ineligible for review because it does not examine the effectiveness of an intervention.

Lee, P. Y. (2007). *Teaching primary school mathematics: A resource book.* Singapore: McGraw-Hill. The study is ineligible for review because it does not include an outcome within a domain specified in the protocol.

Leinwand, S., & Ginsburg, A. L. (2007). Learning from *Singapore Math*. *Educational Leadership, 65*(3), 32–36. The study is ineligible for review because it is not a primary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Waight, M. M. (2006). *The Implementation of* Singapore Mathematics *in a regional school district in Massachusetts 2000–2006: Remarks to National Mathematics Advisory Panel.* Cambridge, MA. The study is ineligible for review because it does not provide enough information about its design to assess whether it meets standards.

4. New Elementary Mathematics is no longer used in Singapore schools.
5. This review refers to studies of *Singapore Math* in middle school or junior high school. Studies of *Singapore Math* conducted in elementary school or high school were out of the scope of the Middle School Math protocol.