



Executive Summary

**Evaluation of the Singapore Math
Pilot Program
Year 2 Report of Findings**

Office of Shared Accountability

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Background

In spring 2000 Superintendent Jerry D. Weast announced his intent to pilot the Singapore Math program in several Montgomery County Public Schools (MCPS) elementary schools in an effort to improve and accelerate mathematics instruction.¹ Comparison of Singapore Math curriculum materials to the list of student objectives assessed by the MCPS Instructional System in Mathematics (ISM) assessments showed that students who participated in Singapore Math were exposed to mathematics topics earlier than was typical in MCPS. The purpose of the pilot was to determine whether, and to what degree, implementation of the Singapore Math program in Grades 1–5 could 1) alter how mathematics concepts were presented by teachers, and 2) elevate and accelerate the mathematics performance of elementary school students. The elementary schools selected for the pilot were College Gardens, Dr. Charles Drew, Highland View, and Woodfield.

Evaluation Design

The evaluation design incorporated three types of schools—the Singapore Math pilot schools and two types of control schools. Within the Singapore pilot schools, two of the schools implemented the curriculum and materials, attended training, and provided support to teachers more fully than the other two. The data in this report are broken out by the extent of implementation by the Singapore pilot schools. That is, the pilot schools with the most complete implementation are labeled as Schools 1 and 2. The pilot schools with lesser implementation are Schools 3 and 4.

In the first year of the evaluation, Office of Shared Accountability (OSA) staff employed a variety of data collection instruments and procedures and focused on implementation issues as well as student achievement outcomes. During the second evaluation year, OSA staff focused their analysis on student outcome measures. As a result, this report contains an analysis of students' performance on Singapore quarterly assessments and TerraNova Comprehensive Tests of Basic Skills (CTBS) and students' middle school mathematics course enrollment and achievement.

Findings

1. Students in Schools 1 and 2 significantly outperformed students in Schools 3 and 4 in most quarters and at most grade levels on the Singapore Math Quarterly Assessments.

¹ MCPS. *Investing in the Call to Action, Fiscal Year 2001*, p. 5.

Additionally, Singapore pilot students significantly outperformed students in the Control A schools in every quarter at all grade levels. Since the Singapore Quarterly Assessments measure concepts that are introduced earlier than the traditional ISM, the data show that Singapore Math students progressed through the curriculum at an accelerated pace compared with their peers in the control schools. This acceleration helped prepare Singapore Math students for higher-level mathematics placements in middle school. Additionally, students in Schools 1 and 2 significantly outperformed students in Schools 3 and 4 and in the control schools on both the mathematics and the mathematics computation subtests of the CTBS, in both Grades 2 and 4.

2. Singapore Math students achieved higher-level mathematics course placements in middle school than did students in the Control A schools. In 2002, students in Schools 3 and 4 continued to improve their placement in higher-level mathematics courses, while students in Schools 1 and 2 remained relatively steady in their placements.
3. Schools 3 and 4 implemented Singapore Math less completely during the first year than did Schools 1 and 2, and this level of implementation was reflected in the first year's student performance data. During the second year, the trend continued in the CTBS and Singapore Math Quarterly Assessment data. However, the second year of implementation showed improved outcomes for students in Schools 3 and 4 in middle school mathematics course placement and achievement. Although no implementation data (e.g., observations, focus groups, surveys) were collected in the second year, it appears from the outcome data that teachers in schools 3 and 4 may have become more comfortable and proficient in teaching the Singapore content and methodology.

Recommendations

Two years of data about the implementation and outcomes of Singapore Math have yielded insights that should be considered important in implementing any new curriculum reform efforts in MCPS. The following recommendations are lessons learned from the pilot study, which apply to implementation of the current elementary mathematics curriculum roll-out.

Recommendation 1: Principals should be formally included in the decision-making processes for reform efforts. One helpful characteristic of the Singapore pilot schools with the greatest degree of implementation was the active involvement and support of the principal as an instructional leader. It may be beneficial to involve those principals whose schools have successfully implemented new reform efforts (such as Singapore Math) as advisors to MCPS curriculum staff or fellow principals regarding how their instructional leadership facilitated change in their schools.

Recommendation 2: End-of-unit assessments to support mathematics instruction and communication with parents need to be carefully developed to yield data that are useful both to inform instruction and to report student outcomes. Validity and reliability studies should be

conducted, and rubrics should be developed to show teachers and parents what level of performance constitutes students’ mastery of the objectives.

Recommendation 3: In implementing any new curriculum reform effort, MCPS needs to be mindful of the amount of time required to complete the implementation process itself, and the level of support teachers need to practice the new curriculum. Year 2 data from Singapore Math indicated some growth in Schools 3 and 4, which did not fully implement the curriculum during the first year. Variations in the length of time needed to come “up to speed” must be considered an important factor as evaluation activities are developed for future reform efforts and as inferences are made regarding program success.