



Course Enrollment Patterns

Current research has found algebra enrollment at the 8th grade level to be a strong indicator of high school mathematics enrollment and academic success in subsequent math courses (Lamicella-Dicarlo, 2004). Moreover, students who enroll in 8th grade algebra also appear to consistently enroll in subsequent math courses at the 9th and 10th grade levels. Consequently, students who complete algebra in the 8th grade attend college at greater rates than those who do not (Spielhagen, 2006).

As part of the program evaluation for the Microsoft Math Partnership (MMP), The BERC Group gathered math enrollment data for 8th, 9th, and 10th grade students to better understand course enrollment patterns. Data collected at the 8th grade level was used to determine the extent to which students took algebra by the 8th grade. Data collected at the high school level was collected to analyze enrollment patterns in subsequent mathematics courses at the 9th and 10th grade levels.

Evaluators gathered and analyzed 8th grade course enrollment data from seven of the partnership districts to determine course enrollment patterns in the 2007, 2008, and 2009 school years. Middle school mathematics courses were classified using two levels of rigor. “Below Algebra” refers to courses designated as remedial or algebra prerequisites, while “Algebra+” courses refers to courses considered algebra equivalent or more advanced placements (e.g. geometry).

Eighth grade math course enrollment data from 2007, 2008, and 2009 are shown in Figure 1. In all three years, the majority of students were enrolled in courses that were classified as below algebra. However, the percentage of students enrolled in algebra or beyond increased over this time period.

MMP district officials described several policy changes that may have led to the increase in percentage of students enrolled in 8th grade algebra equivalent courses. In one district, interviewees described a change in policy for student placement into middle school

math, such that parents are given the information about different math pathways and they decide where their student should be placed. One district representative stated, “Our pathway is such that students that struggle get a second chance at 9th grade. Tracking has been somewhat minimized, and we are trying to keep heterogeneous groups in 6, 7, and 8. We are still keeping the bar very high.” Other districts are also starting to align course placement criteria. Previously, many of the districts placed students by teacher recommendation alone, now many of the districts are assessing readiness for certain math classes using more formalized assessments in addition to teacher recommendations.

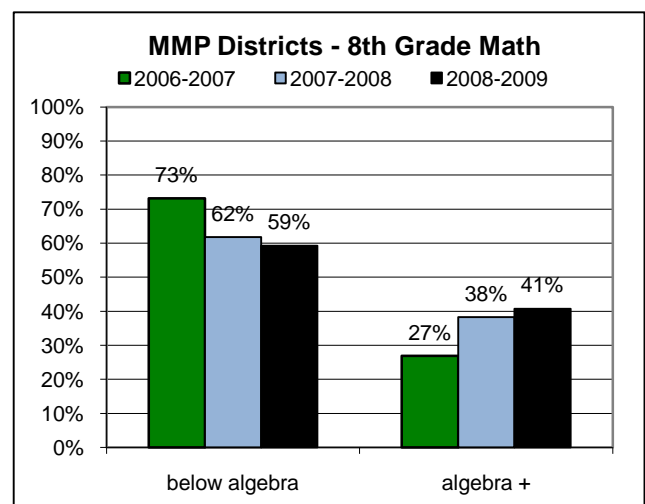


Figure 1. MMP Districts – 8th Grade Math Enrollment

With more and more students beginning to take algebra in the 8th grade, many districts are recognizing the need to support teachers in middle and junior high school who teach algebra equivalent courses. One interviewee shared,

“We have a huge initiative to support teachers of algebra at the high school, and now we are getting that to middle school teachers of algebra as well.”
 ~ Administrator

In some districts, elementary school teachers are also getting additional support, as they try to prepare their students to go into higher levels of math in middle and junior high school.

Researchers also analyzed math enrollment patterns of students at high schools fed by partnership schools. Evaluators obtained transcripts for 9th and 10th grade students at twelve high schools for the 2006-2007 and 2007-2008 school years. These schools were selected according to the feeding patterns of the funded middle schools and junior high schools. The purpose of the high school transcript analysis was to determine enrollment patterns in math courses that follow algebra. Course enrollment patterns at the 9th grade level are shown in Figure 2, and enrollment patterns at the 10th grade level are shown in Figure 3.

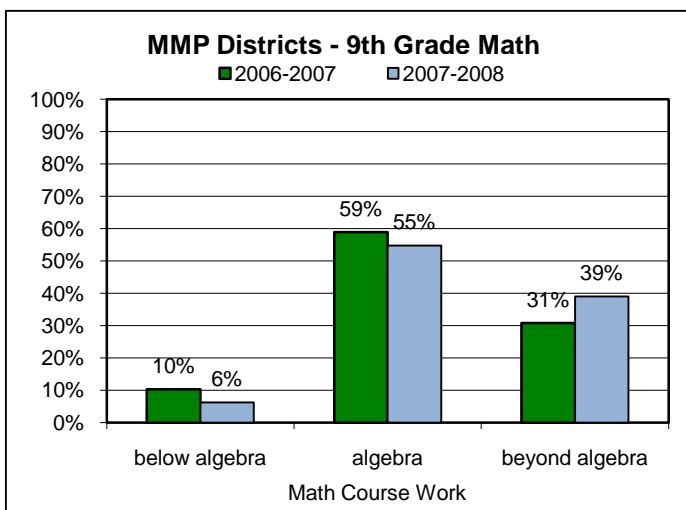


Figure 2. 9th Grade Math Enrollments of MMP Districts

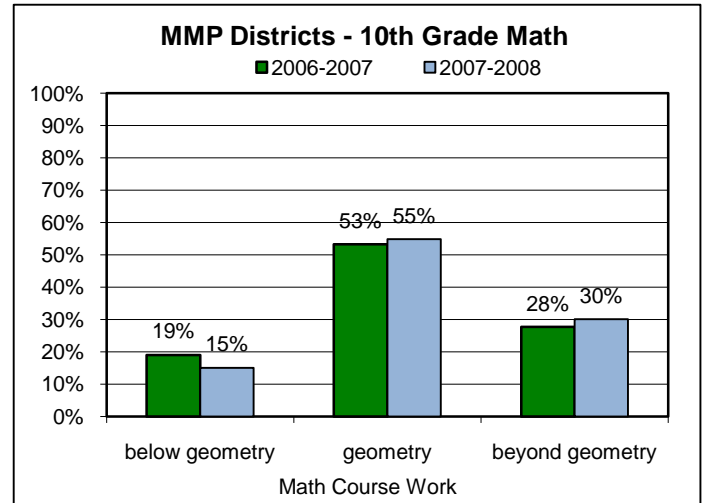


Figure 3. 10th Grade Math Enrollments of MMP Districts

In 2006-2007, at the 9th grade level, 59% of students took math courses at grade level. This percentage decreased for 2007-2008 with more students taking above grade level courses. The percentage of students enrolled in courses classified as ‘Beyond Algebra’ increased by 8% from 2006-2007 to 2007-2008. At the 10th grade level, the percentage of students enrolled in geometry equivalent courses increased by 2% from 2006-2007 to 2007-2008. Similarly, the percentage of students enrolled in ‘Beyond Geometry’ courses also increased by 2% over this time period.

These positive changes in course enrollment patterns may have been a result of some MMP districts adopting new student placement guidelines that result in a larger number of students with access to high-level math courses. Most of the MMP school districts are heading toward students taking Geometry in the 9th grade and are working to accomplish this goal by minimizing gate keeping for students who elect to take more advanced math courses in earlier grade levels. Tracking this type of data is particularly important for districts and schools concerned with preparing students for college. Providing more 8th grade students with the opportunity to take algebra should lead to a greater percentage of graduates being college ready.

References:
 Lamicella-Dicarlo, M. (2004). *The effects of self-concept, perception of parents' expectancies, and locus of control on mathematics course enrollment* [Dissertation]. Retrieved January 7, 2009, from PsycINFO database.
 Spielhagen, F. (2006, January 1). Closing the Achievement Gap in Math: The Long-Term Effects of Eighth-Grade Algebra. *Journal of Advanced Academics*, 18(1), 34-59. (ERIC Document Reproduction Service No. EJ7539.