

# Archived Information

Massachusetts Department of Education

**GOAL: Developing a Research Base**

**ACTIVITY: Middle School Mathematics Initiative (MSMI)**

**SUMMARY:** The impetus for this initiative was the need for the Massachusetts Department of Education to find ways to help middle schools with large numbers of students failing the grade 8 statewide mathematics test. This two-year curriculum intervention and research project was designed and carried out in collaboration with faculty at the University of Massachusetts-Lowell using coaching, lesson planning, pre-/post-assessment for students, and mathematics course work for teachers. The Department employed six highly experienced mathematics teachers for two years as mathematics coaches, in order to assess the value of coaching in improving student learning in mathematics. The task of the six coaches was to train 50 teachers in grades 6, 7, and 8 in eight school districts in lesson planning and implementation over the course of more than one year (24 teachers in the first year of the study continued into the second year of the study).

Students in both the intervention and the comparison classes were given pre- and post-tests consisting of items similar to those found on the grade 6 statewide mathematics test. The Department sought to determine learning gains during the academic year and to pinpoint students' achievement level in arithmetical skill and understanding more precisely than the statewide tests, which are given only at the end of two-year grade spans. In two years, 51 teachers took a mathematics course addressing middle school content offered at several state colleges. This feature was intended to help the Department explore the relationship between teacher knowledge in mathematics and gains in student learning.

**PURPOSE:** The purpose of the Middle School Mathematics Initiative was to help Massachusetts teachers in under-performing middle schools improve student achievement in mathematics through the use of mathematics coaches emphasizing a systematic approach to lesson planning and implementation appropriate for any mathematics class.

**ACCOMPLISHMENTS SO FAR:** Students in the MSMI classrooms had gain scores that were significantly higher than similar students in classrooms with no intervention, even though there was a much higher percentage of students identified as Limited English Proficient in the MSMI classrooms. In addition, teachers' lesson planning ability was related to the gain scores, that is, students of teachers with higher scores on lesson planning made significantly more improvement than students of teachers with lower lesson planning scores. We also found that students of teachers with more teaching experience achieved higher gains than students of teachers with less teaching experience. Nevertheless, although students in the intervention group had significantly higher gain scores, their overall level of performance left much room for improvement (e.g., out of 20 points on the post-test, which consisted of items pitched to a grade 6 level, the intervention group averaged only 12 points.) The comparison groups fared about the same. Thus, one may seriously question the practical significance of these gains. One may also seriously question the value of coaching as a strategy (and a very expensive strategy at that) for improving mathematical learning in very low-performing students.

**Plans for the Next 12 Months:** As a result of this intervention research project to determine how to improve middle school mathematics achievement, we cannot say that we gained clear answers to our question. We did learn that there is more to explore than we initially thought, and we hope to obtain some information on the importance of these other factors in a new study the Department is sponsoring during the academic year, 2002-2003, titled "An Examination of School-Based Factors Affecting Performance on the Grade 8 MCAS Mathematics Assessment."