The California Academic Partnership Program

Partnering to Increase Achievement and Opportunity in California Public Schools

The Impact of the Use of the Mathematics Diagnostic Testing Project in San Diego Unified School District: Teacher Survey Component

Summary

Karen Volz Bachofer

Andrew C. Zau

Julian R. Betts

June 1, 2012

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Since 1977, the Mathematics Diagnostic Testing Project (MDTP) has provided California teachers with free diagnostic tests designed to measure student readiness for secondary school mathematics courses. MDTP tests have been used widely across the state for more than 40 years, and voluntary use of MDTP tests in San Diego Unified School District (SDUSD) has been quite similar to statewide use. During the 2000 through 2008 school years, in order to inform mathematics course placement decisions for the following year, SDUSD officials mandated a spring administration of the MDTP Readiness Tests to all students enrolled in certain mathematics coursework. Even though mandated administration of designated MDTP tests has been discontinued in SDUSD, some district mathematics teachers continue to use MDTP tests on a voluntary basis.

This study, commissioned by the California Academic Partnership program (CAPP), extends an earlier study by Betts, Hahn, and Zau (2011) by exploring the ways that mathematics teachers in SDUSD use, or have used, MDTP tests and examining the extent to which the voluntary and mandated use of MDTP tests, varying mathematics program characteristics, instructional practice, and professional development opportunities for teachers are associated with student learning in mathematics. The primary data collection method used in this study was an online teacher survey deployed to all teachers assigned to a mathematics classroom at a SDUSD secondary school in October 2011.

Betts, Hahn, and Zau examined the effect of voluntary and mandatory MDTP testing in SDUSD on students' mathematics achievement from 1999-2000 through 2006-07. They found that mandatory MDTP testing was associated with gains on the California Standards Tests (CSTs) in mathematics the following year and that, if a student was given an MDTP test two years in a row, those gains persisted and strengthened slightly. The voluntary use of MDTP tests, on the other hand, had no detectable relationship to student gains in mathematics.

While they were able to explain about 6 to 12 percent of the impact of mandatory MDTP testing, Betts, Hahn, and Zau determined that most of the effect of MDTP occurred for reasons other than summer school and appropriate classroom placement. They suggested that possible reasons for student gains might include the fact that MDTP results allow teachers to identify and address specific learning needs in mathematics, that mandated use of the MDTP across a particular grade level might lead to discussion among mathematics

teachers about strategies to address students' learning needs, or that coordination among teachers and mathematics departments might result in systematic review and refinement of the school's instructional program in mathematics. Each of these is addressed below.

District-Mandated MDTP Testing

Identification of Students' Learning Needs. Even though the stated purpose for district-mandated administration of MDTP readiness tests was to inform placement decisions for the following school year, study findings indicate that the number one use of MDTP results *before the end of the school year* in which the test was given was reviewing results to determine students' overall strengths and weaknesses, rather than to inform placement decisions. When asked how they used MDTP results *in the year following administration*, teachers most often reported that they reviewed results to determine students' overall strengths and weaknesses and modified their teaching to help students understand and correct misunderstandings and errors revealed by the test. Mandated MDTP testing, then, did provide benefits that went well beyond identifying students for summer school attendance and appropriate mathematics course placement. Teachers – nearly 93 percent of them – reported using MDTP results in the ways that test developers envisioned, even though the intent of the district mandate was much narrower.

Collaboration to Address Student Learning Needs. Somewhat surprisingly, survey responses indicate that teachers were much more likely to review results from district-mandated MDTP administration on their own than to discuss them at a mathematics department meeting, with other teachers, or with a school administrator, counselor, or mathematics coach. In fact, teachers were more likely to discuss test results with their students than their colleagues. Conversations with students may have been prompted by teachers' efforts to help students understand the impact of MDTP test results on course placement. It is also possible that the district mandate did not provide teachers with sufficient guidance about the ways in which MDTP results could be used to address students' learning needs, or training to support such uses.

Systematic Review and Refinement of the School's Mathematics Program. A majority of teachers responding to the survey indicated that their school did not change its approach to teaching mathematics based on an analysis of the results of district-mandated MDTP testing. Again, this may be due to the fact that the district-mandated MDTP was intended to inform course placement decisions and to identify students who might benefit from summer school participation.

Given the "top down" nature of the district-mandated MDTP administration, it is somewhat surprising that nearly half of the teachers responding to the survey indicated that the impact of district-mandated testing was somewhat positive or extremely positive, and an additional 46 percent were neutral. Indeed, only 6 percent of teachers indicated that the impact of the district-mandated MDTP testing was negative.

Sadly, fewer than 4 percent of survey respondents reported using MDTP Written Response items. This finding, coupled with the fact that several teachers' suggestions for improving MDTP were related to providing an item bank of problems aligned with students' learning

needs, suggests that most teachers are not aware that this valuable resource is already available to them.

Voluntary MDTP Testing
Two-thirds of survey respondents reported that they had voluntarily administered an MDTP test. (That is, the decision to administer the test was made by an individual teacher or school, not by district officials as part of a districtwide mandate.) Voluntary administration of the MDTP was most often the decision of their school's mathematics department and, typically, MDTP tests were administered in every class for which a given MDTP test was selected (e.g., all Algebra classes).

Surprisingly, teachers who administered the MDTP under the *district mandate* were more likely to report that they reviewed results on their own to determine students' strengths and weaknesses than teachers who voluntarily administered an MDTP test in the spring. As might be expected, given the consequences associated with MDTP scores, the teachers who reported administering a mandated test were also more likely to have discussed MDTP results with their students and distributed MDTP student letters. These findings – reviewing results to determine student strengths and weaknesses and discussing results with students by district-mandated users – may partially explain the Betts, Hahn, and Zau (2011) finding that voluntary use of MDTP testing had no detectable relationship to student gains in mathematics. On the other hand, teachers who voluntarily administered an MDTP test were much more likely to indicate that the MDTP had a positive effect on the goal of teaching mathematics to their students.

No Voluntary MDTP Testing
Nearly one-third of survey respondents indicated that they had never voluntarily administered an MDTP test. Most often, this was because they had no knowledge of the MDTP program or how it works.

Use of Instructional Time
Survey results indicate that students spent the greatest proportion of their instructional time in mathematics classrooms watching the teacher demonstrate or explain how to do a procedure or solve a problem or listening to the teacher present mathematical concepts, ideas, applications, or results. They spent the least amount of instructional time writing about mathematics or using manipulatives, measurement instruments, and data collection devices.

Professional Development
The two topics most frequently addressed in mathematics professional development attended by survey respondents were alignment of instruction to curriculum, standards, and mandated tests, and technology to support student learning. Both of these topics are consistent with districtwide professional development priorities during the years covered by the study. The topic addressed least frequently was in-depth study of mathematics. The most widely attended type of professional development listed was a mathematics department meeting focused on mathematics or mathematics education.

Conclusions

A majority of teachers responding to the survey used results from MDTP testing, whether district-mandated or voluntary, for a range of purposes – most notably, to determine students' strengths and weaknesses, to modify their teaching to help students understand and correct misunderstandings, and to inform appropriate placement in mathematics coursework. Teachers, especially those who administered the MDTP voluntarily, have positive opinions about MDTP testing – but are unaware of all of the services and supports available to them from MDTP. Given that prior research has shown that district-mandated MDTP testing results in improved student outcomes in mathematics, and that this study's findings indicate that a majority of teachers – whether district-mandated or voluntary users – used MDTP results for instructional purposes and believe in the efficacy of the MDTP, conversations with district officials about integrating the use of MDTP testing into the district's secondary mathematics program should be considered.

The Authors

Karen Volz Bachofer
Director of the San Diego Education Research Alliance (SanDERA) at
University of California, San Diego

Andrew C. Zau
Senior Statistician of the San Diego Education Research Alliance (SanDERA) at
University of California, San Diego

Julian R. Betts
Executive Director of the San Diego Education Research Alliance (SanDERA) at
University of California, San Diego

For more information on SanDERA go to http://sandera.ucsd.edu