



CSU/UC MDTP

NEWSLETTER

Mathematics Diagnostic Testing Project

NEW STUDY HIGHLIGHTS EFFECTIVENESS OF MDTP

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“Does Diagnostic Math Testing Improve Student Learning?”, a study measuring the effectiveness of MDTP as a tool to improve student learning, was released October 12 by the Public Policy Institute of California (PPIC).

Participation in a math testing program that gives teachers timely, detailed feedback on individual students can result in strong achievement gains, according to the study prepared by Julian Betts (Professor of Economics at UC San Diego). The San Diego Unified School District mandated the use of some MDTP tests from fall 2001 to spring 2007 in specific grades. Using data during this period, the study found that gains for students were large enough to move a student originally at the 50th percentile in math to the 57th percentile a year later.

The San Diego district’s goal in requiring this testing was to help place students in math classes of appropriate difficulty the following year. Schools also used the tests to identify students who should attend summer school. The report concluded that San Diego was successful in both areas. Students were more accurately placed in math classes suited to their skill levels, and low-achieving students were more likely to attend summer school.

“The timely information from diagnostic testing allows teachers to act quickly on what they learn about

a student’s math skills,” says Julian Betts, PPIC Bren policy fellow, who co-authored the report with Youjin Hahn, assistant professor at Monash University, Australia, and Andrew Zau, senior statistician for the San Diego Education Research Alliance, hosted by the economics department at the University of California, San Diego. “More districts could use this type of testing to direct help to struggling students and place them in classes that will help them succeed.”

The diagnostic tests were used a second way in San Diego. Many teachers used the program to test individual classes. (Teachers statewide have used the test this way for several decades.) This voluntary testing was not used to recommend summer school placement or to channel students into appropriate math classes. The PPIC authors found that voluntary testing failed to achieve the same benefits as systematic use. A possible reason is that widespread testing encouraged the whole math department at a school to work together on diagnosing and overcoming students’ difficulties.

The Donald Bren Foundation funded the study, and the California Academic Partnership Program (CAPP) provided support for related research. The full report can be downloaded from <http://mdtp.ucsd.edu/>. [Source: PPIC Press Release of October 11, 2011]

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UPDATE ON RELEASE OF NEW CP AND CR MATERIALS

Status of New CAHSEE Preparatory (CP) Diagnostic Test & Written Response Items

Two summers ago, the MDTP workgroup began developing a CAHSEE Preparatory (CP) Diagnostic test. They emphasized that this CAHSEE diagnostic test would not be another form of “test prep” where students would practice on items similar to the actual test nor would it predict students’ performances on the CAHSEE. Rather, the CAHSEE diagnostic test would serve solely to identify students’ misunderstandings to help teachers more effectively teach the concepts and skills that are tested on the CAHSEE. Understanding this focus, the workgroup found central conceptual ideas underlying the CAHSEE and constructed test items to assess these foundational concepts and developed a preliminary test version that was field-tested last year. The response to that first field test was exceptionally positive both from CAHSEE preparatory teachers and from regular 10th grade mathematics teachers.

This past summer, the MDTP workgroup analyzed the results of the first field test to determine how well the new questions worked. The workgroup prepared a second (and final) field test version for the CAHSEE Preparatory (CP) diagnostic test that will lead to the release of a new 45-item CP test in the fall of 2012. Field-testing is already well underway.

To support math teachers in using this new test, an MDTP workgroup committee began developing several written-response items last spring to supplement the CP test and enable teachers to enrich their curriculum through the use of student written work for diagnostic assessment. (MDTP’s goal is to release a suite of 12-15

written response items that address at least two topics within each topic area of the CP test upon the release of the CP test in fall of 2012.) The committee identified nine existing written response items (at the PR, AR, and GR levels) that could be used to support the CP test. This summer the committee wrote six new written response items specifically to support the CP test. Regional site directors have contacted local teachers to assist MDTP in field-testing the new CP written response items. If you are teaching a CAHSEE prep course or any 10th grade math course and are interested in helping us with these field tests, please contact your MDTP site director right away. We greatly appreciate the cooperation of teachers who administer field tests for us.

Status of New CR Test

The MDTP workgroup has continued the development of a new Calculus Readiness (CR) test that began four years ago with work on updating the set of specifications. In the summer of 2010, a second revised version of the CR test was developed and field-tested last year. It included several new trigonometry items addressing more trig content in response to many requests from current CR users. This past summer, we analyzed the results of the field test to determine how well the new questions worked and to help us refine them. The workgroup prepared a new (and likely final) test form that will lead to the release of a revised 45-item CR test in the fall of 2012 replacing the CR40A97 and CR55A97 tests. Field-testing is already well underway. As with all MDTP tests, the data collected from these field tests is necessary for us to create tests meeting our high quality standards. We greatly appreciate the cooperation of teachers who administer field tests for us.

MDTP SURVEY RESULTS

In the spring 2011 newsletter, MDTP asked users and non-users to complete a brief survey to help MDTP better understand how its tests and materials were being used. The purpose of the survey was to help MDTP respond to the needs of its users and understand how it might be able to serve non-users too. A total of 82 teachers responded to the online survey, and each received a \$10 gift card. MDTP appreciates the responses.

The following data were collected on the first six survey questions using the scale 1-5 (with 1 indicating Not At All and 5 indicating A Great Deal):

1. To what extent do you use MDTP diagnostic tests and materials? 3.59
2. To what extent do you share test results with:
 - a. Students: 3.75

- b. Parent: 3.22
- c. Other Math Teachers: 4.01
- d. Department Chair: 3.99
- e. School Administrators: 3.27
- f. District Staff: 1.97

STRENGTHENING MATHEMATICS INSTRUCTION (SMI)

By Bruce Arnold (Director, CSU/UC Mathematics Diagnostic Testing Project (MDTP)) & Zulmara Cline, Ph.D. (Associate Director, Teacher Education and Public School Programs, CSU Chancellor's Office)

A committee of mathematics professors, math educators from the CSU, and math experts from county offices and high schools has developed a short professional development program (Strengthening Mathematics Instruction or SMI) for math teachers who work at the level of Algebra I or above. MDTP is collaborating with the CSU to incorporate the use of MDTP tests in the SMI curriculum to assist teachers in analyzing student misconceptions. See the CSU Math Success web site, <http://www.csusuccess.org/smi>.

The curriculum includes instruction on developing cognitively complex problems, analyzing student misconceptions, and understanding college readiness through teaching strategies that:

- Promote mathematical and numerical flexibility
- Incorporate multiple representations
- Help students extend procedures and emphasize structures

The program includes two components: an online program that takes about one hour to complete and includes some tasks to be done prior to the workshop that follows, and the workshop itself. The workshops are provided at no cost by a team of CSU and K-12 math experts around the state. These workshops, the equivalent of 16 to 21 hours of instruction, are scheduled as a two day workshop or one full day and a series of follow-up workshops. While the online component provides information on the EAP (Early Assessment Program), how it works, what it means for students and parents, etc., the workshop focuses on helping students to develop sufficient math competency that they will perform successfully on standardized tests, including the EAP and the Entry Level Math (ELM). To register for both the online workshop and a face-to-face workshop, go to <http://pd.csusuccess.org>.

MDTP SURVEY RESULTS

Continued from p 2

- To what extent have MDTP test result reports and other MDTP services helped or encouraged you to:
 - Revise curricula: 3.35
 - Adapt or modify teaching strategies: 3.37
 - To what extent have you observed the following as a result of MDTP testing:
 - Improved student readiness for courses: 3.32
 - Student achievement gains: 3.23
 - Increased retention in math courses: 2.84
 - Increased retention in math course sequences: 2.81
 - To what extent are MDTP test results used to:
 - Assess students near the end of a course: 3.68
 - Assess students near the beginning of a course: 3.22
 - Identify weak topic areas among the class in general: 3.57
 - Identify weak topic areas for individual students: 3.49
 - Identify specific misunderstandings for the class in general: 3.24
 - Identify specific misunderstandings for individual students: 3.23
 - Place students: 3.75
 - Have you encountered any resistance to the use of MDTP tests among:
 - Other math teachers in your school: 1.85
 - School administrators: 1.42
 - District staff: 1.39
 - Parents: 1.32
 - Students: 1.78
 - "Why do you use MDTP tests? (Check all that apply)"
I decided on my own: 41.5%
Our math department decided to use them: 53.7%
Our department chair decided to use them: 35.4%
Our school administration requires their use: 14.6%
Our district requires their use: 17.1%
- The next three questions asked respondents to describe the greatest strengths of MDTP, any weaknesses, and suggestions to make MDTP materials and services even more useful. A wide range of responses was received. The MDTP Director's Office and MDTP site directors are evaluating every response and considering suggestions to improve MDTP materials and services. We will summarize in the next (spring 2012) newsletter any improvements that MDTP will implement.

NRC REPORT

NRC Report Highlights Benefits of Low-Stakes Testing

MDTP tests have always been designed to be “low-stakes” tests. They provide useful information to teachers and students and help create opportunities for all students to learn more mathematics.

“High-stakes” tests, such as CSTs, CAHSEE, SATs, and final exams, can have serious positive or negative consequences for students, teachers, or schools. These tests are often designed to ensure that students have met course or curriculum objectives. Compared to high-stakes tests, low-stakes tests:

- require minimal vs. maximal security
- have a “true score” vs. a high score as a goal
- discourage “teaching to the test” vs. almost requiring it

A recent National Research Council report, “Incentives and Test-Based Accountability in Education”, found that high-stakes tests lead to score inflation and a de-emphasis of important skills and knowledge in the curriculum through excessive test preparation. The report affirmed the importance of low-stakes tests to complement high-stakes tests in evaluating student performance. Because diagnostic data can be compromised when tests are high-stakes, MDTP tests are designed to be “low-stakes” tests and are developed independently from specific curricula or standards yet are consistent with both California’s 1997 and Common Core Mathematics Standards.

Visit http://www.nap.edu/catalog.php?record_id=12521 to download a copy of the report.



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PROBLEM CORNER

Vahid Fozi, a teacher at High Tech High North County in San Marcos, presented the only correct solution to last spring’s Quilt problem! MDTP has sent him a \$25 gift certificate at Barnes & Noble for his solution. For a complete solution to the Quilt problem, send email to mdtp@ucsd.edu with the subject “Quilt Problem Solution”.

This issue’s problem comes courtesy of Professor Guershon Harel (UCSD Mathematics).

Rectangular Land Problem

A farmer owns a rectangular piece of land. The land is divided into four rectangular pieces known as Region A, Region B, Region C, and Region D, as shown in the figure.

A	C
B	D

One day the farmer’s daughter, Nancy, asked him, “What is the area of our land?” Her father replied, “I will only tell you that the area of Region B is 200 square meters larger than the area of Region A; the area of Region C is 400 square meters larger than the area of Region B; and the area of Region D is 800 square meters larger than the area of Region C.” What answer to her question should Nancy derive from her father’s statement?

Submit your solution to Bruce Arnold, University of California, San Diego, Mathematics Department, 6311 AP&M, 9500 Gilman Drive #0112, La Jolla, CA 92093-0112 or barnold@ucsd.edu. The winner will receive a \$25 gift certificate to Barnes & Noble.

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MDTP web site at <http://mdtp.ucsd.edu>

MDTP REGIONAL SITE INFORMATION

<p>Berkeley Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Sonoma, and Stanislaus counties.</p>	<p>UC Berkeley Director: Emiliano Gomez (510) 642-0752 Asst.: Jacqueline Bonds (510) 642-0846 Fax: (510) 642-8204 mdtp@math.berkeley.edu</p>
<p>Chico Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Tehama, Trinity, and Yuba counties.</p>	<p>CSU Chico Director: Ben Levitt (530) 898-5489 Asst.: Jessica Voisine (530) 898-4103 Fax: (530) 898-3097 mdtp@csuchico.edu</p>
<p>Davis Alpine, Amador, Calaveras, El Dorado, Placer, Sacramento, San Joaquin, Solano, Sutter, and Yolo counties.</p>	<p>UC Davis Director: Grant Acosta (530) 754-7743 Asst.: Trish Ramos (530) 754-9504 Fax: (530) 753-8420 plramos@ucdavis.edu</p>
<p>Fresno Fresno, Inyo, Kern, Kings, Madera, Mariposa, Merced, Mono, southern San Benito, Tulare, and Tuolumne counties.</p>	<p>CSU Fresno Director: Maria Nogin (559) 278-4908 Asst.: Devonna Butler (559) 278-2992 Fax: (559) 278-2872 mnogin@csufresno.edu</p>
<p>Fullerton Orange county, and parts of Los Angeles and Riverside counties.</p>	<p>CSU Fullerton Director: David Pagni (657) 278-2671 Asst.: Claire Bakewell (657) 278-2691 Fax: (657) 278-3972 mdtp@fullerton.edu</p>
<p>Los Angeles Los Angeles and Ventura counties except for schools near Fullerton.</p>	<p>UC Los Angeles Director: Mary Sirody (310) 825-9477 Fax: (310) 825-8914 mdtp@ucla.edu Shipping & Scoring Annex: Office Manager: Jessica Hoover (310) 825-2495 Fax: (310) 206-7261</p>
<p>San Bernardino Inyo, Mono, and San Bernardino counties and part of Riverside county.</p>	<p>CSU San Bernardino Director: John Sarli (909) 537-5374 Asst.: Leeanne Richardson (909) 537-7670 Fax: (909) 537-7119 mdtp@csusb.edu</p>
<p>San Diego Imperial and San Diego counties and part of Riverside county.</p>	<p>UC San Diego Director: Bruce Arnold (858) 534-3298 Asst.: Monnie Barker (858) 534-3373 Fax: (858) 534-1011 mdtpsandiego@ucsd.edu</p>
<p>San Luis Obispo San Luis Obispo, Santa Barbara, and southern Monterey counties.</p>	<p>Cal Poly San Luis Obispo Director: Steve Agronsky (805) 756-1683 Asst.: Lorin Nevius (805) 756-2445 Fax: (805) 756-6537 lmnevius@calpoly.edu</p>
<p>Santa Cruz Northern Monterey, northern San Benito, Santa Clara, and Santa Cruz counties.</p>	<p>UC Santa Cruz Director: Bruce Cooperstein (831) 459-2150 Central Coast Coord.: Ed Migliore (831) 459-1240 Asst.: Dana Mathers (831) 459-2400 Fax: (831) 459-3260 mdtp@ucsc.edu</p>

AVAILABLE MDTP DIAGNOSTIC TESTS

Test Name	Description	Calculator Prohibited	Calculator Optional*	Calculator Required
PR Prealgebra Readiness	Assesses some concepts needed for success in a course immediately preceding a first-year algebra course and subsequent success in that first-year algebra course. This test is often given near the beginning of a course immediately preceding a first-year algebra course. Spanish version available.	PR40A04 0814004		
AR Algebra Readiness	Assesses some concepts needed for success in a first course in algebra. Calculator prohibited and calculator required versions available. 45 question and 50 question versions available. Spanish versions available. The AR50A10 test is a computer delivered form only available online via Daskala. [AR50/90 available while in stock.]	AR45A10 0714510 AR45A00 0714500 AR50/90 0715090 <i>AR50A10</i>		AR50X92 0775092
EA Elementary Algebra Diagnostic	Assesses some concepts needed for success in a second course in algebra. Appropriate when the second course follows immediately after a first-year algebra course and students have not studied a year of geometry. Spanish versions available.		EA50A90 0315090	<i>Scientific</i> EA45X91 0374591
GR Geometry Readiness	Assesses some concepts needed for success in geometry after completing Algebra I or II. Includes some informal geometry students should have encountered prior to and during algebra. Spanish versions available. [GR45A93 available while in stock.]		GR45A06 0414506 GR45A93 0414593	GR45X94 0474594
SR Second Year Algebra Readiness	Assesses some concepts needed from first-year algebra and geometry for success in intermediate algebra following a course in geometry. Spanish versions available. [SR45A93 available while in stock.]		SR45A06 0314506 SR45A93 0314593	<i>Scientific</i> SR45X94 0374594
IS Integrated Second Year Readiness	Assesses some concepts needed for success in the second year of an integrated mathematics curriculum. This test was based on the common content of two of the integrated curricula in use in California.		IS45A00 0414500	
IT Integrated Third Year Readiness	Assesses some concepts needed for success in the third year of an integrated mathematics curriculum. This test was based on the common content of two of the integrated curricula in use in California.		IT45A00 0314500	
MR Mathematical Analysis Readiness	Assesses some concepts needed for success in a course following two algebra courses and a geometry course. This course is often called trigonometry, precalculus, or mathematical analysis. [MR45A92 available while in stock.]		MR45A08 0214508 MR45A92 0214592	<i>Scientific</i> MR45X94 0274594
CR Calculus Readiness	Assesses some concepts needed for success in a first calculus course. 40 question and 55 question versions available, with suggested times of approximately 60 and 90 minutes respectively.		CR40A97 0114097 CR55A97 0115597	<i>Scientific</i> CR40X96 0174096 CR55X96 0175596
BC Beginning Calculus Readiness	Assesses some concepts and facility with graphing calculators needed for success in a first calculus course requiring graphing calculators. Some questions require the use of a graphing calculator.			<i>Graphing</i> BC30X97 0173097

*Calculators are not recommended on GR45A06, SR45A06, and MR45A08.

MDTP's Written Response Materials CD is available upon request and supplements most of MDTP's tests.

UPCOMING EVENTS

Continued from p 8

2-3 December 2011: CMC-North (Asilomar) Conference

MDTP will have a booth in Merrill Hall. For more information: <http://www.cmc-math.org/ASIL>

18 January 2012: CSU Fullerton Users' Conference

For more information and registration contact Claire Bakewell at the Fullerton site, mdtp@fullerton.edu.

February/March (date TBD): CSU San Bernardino Users' Conference

For more information and registration contact Leeanne Richardson at the San Bernardino site, lhartson@csusb.edu.

3 March 2012: UCLA Philip C. Curtis Jr. Center Annual Mathematics and Teaching Conference

The conference will include an MDTP strand. The Curtis Center web pages will include the program and registration information, <http://www.curtiscenter.math.ucla.edu/>.

March 2012 (date TBD): UC Santa Cruz Users' Conference

For more information contact Dana Mathers at the Santa Cruz site, mdtp@ucsc.edu.

21 March 2012: UC Davis Math Teachers Workshop

For more information and registration contact Trish Ramos at the Davis site, plramos@ucdavis.edu.

29 March 2012 from 3:30 to 7:00 p.m.: UC San Diego Users' Conference

For more information and registration contact Monnie Barker at the San Diego site, mdtpsandiego@ucsd.edu.

Updated information, registration forms, and links to sites are available at <http://mdtp.ucsd.edu/NewsEvents.shtml>.

ONLINE MDTP TESTING (DASKALA) UPDATE

MDTP began offering its tests in fall 2009 in a new format: online. Teachers, schools, and districts can now administer most MDTP tests online and immediately view student, class, and school results through the Daskala software platform at a cost of \$1 per test administered up to a maximum of \$3 per student tested each academic (1Jul-30Jun) year. [MDTP's paper tests and scoring are still available at no cost!] Teachers throughout the state have warmly received the new online tests with more than 70,000 tests administered since implementation.

The online reporting screens include all of the information in MDTP's printed reports in formats that are based on those reports. It is now easy to re-sort the data presented in many ways and to drill down to access information not available in MDTP's printed reports. Electronic reporting both reduces the time to get test results back to teachers and schools and reduces the time teachers and administrators need to review the diagnostic reports. Daskala also provides some features not found in MDTP's printed results such as the average amount of time students looked at each question and "tags" for each incorrect answer choice that suggest possible errors made by students or misunderstandings held by students.

Some schools lack the technology (e.g., no internet connections or lack of computers) necessary to test students online. However, they have asked if they could still benefit from the new Daskala analytical tools and be able to access online their test results from MDTP paper tests. The answer is yes they can! Paper test results can be easily uploaded into Daskala at the same cost of \$1 per test per student (with a maximum of \$3 per student per year). Teachers should contact MDTP at mdtp@ucsd.edu about this service.

For more information about online MDTP testing using Daskala, please visit the MDTP web site, <http://mdtp.ucsd.edu/daskala.shtml>.

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UPCOMING EVENTS

Each year, MDTP sites hold regional conferences to discuss current issues in mathematics education in California and effective uses of MDTP in the classroom. The conferences provide an opportunity for conversations among elementary, middle, and high school mathematics teachers and administrators as well as college and university mathematics faculty. MDTP also presents and host booths at some regional California Mathematics Council conferences, this year at both the Palm Springs and Asilomar conferences. Please consider attending some of these events listed on page 7.



MDTP Booth CMC Palm Springs
November 2011