Math MDTP Cut-Score Validation – Follow-up

Steve Blohm
Institutional Research Analyst
Planning and Research Office
Cabrillo College
Fall 2014
The purpose of this brief report is to provide the results of a follow-up study to Rick Fillman’s Summer 2013 Math MDTP Cut-Score Validation study. One of the requirements for validating a placement tool is to show that students feel that they were placed correctly at least 75% of the time and that instructors feel that students were placed correctly at least 75% of the time. In the 2013, study the MDTP test failed to validate for placement into Math-152 Based on the 75% threshold of agreement requirement for instructors.

Prior to the Spring 2014 semester, Math-142 was created as an alternative to Math-152 for non-science majors. The same entrance requirements (MDTP cut-scores or other prerequisites) were used for both courses. Students self-selected into Math-142 or Math-152 based on their education goals. For the purposes of this study we combine the two classes into one group.

Math-142 and Math-152 students were surveyed early in the Spring 2013 semester as to the appropriateness of their placement. In the survey, students indicated, whether their skills and knowledge caused them to feel they were under-qualified, qualified, or over-qualified for the course material. Likewise, instructors in these sections rated each student as to the appropriateness of their placement.

Based on the 283 students who placed into Math 142 or Math 152 via the MDTP assessment and also took the survey we found the following results:

Instructors viewed students as underprepared 20% of the time, correctly placed 75% of the time, and over-prepared 5% of the time. Students viewed themselves as underprepared 10% of the time, correctly placed 85% of the time, and over-prepared 5% of the time. Based on the current study, placement does meet the 75% agreement threshold requirement.
While the MDTP does meet the 75% agreement threshold, placement methods for Math 142 and Math 152 can still be improved. The placement score range for Math 142 and Math 152 is 12 to 23 on the 45 item MDTP. The MDTP is scored by awarding a student one point for a correct response and zero points for an incorrect or blank response. There is no penalty for guessing. Students are encouraged not to guess, but if students do guess on items that they do not know how to solve, then the reliability of the MDTP for placement into Math 142 and Math 152 is questionable. There is a 17.4% chance of scoring 12 or higher by guessing on all 45 items. If a student knows how to solve just 4 of the 45 items and guesses on the remaining 41 items, then the expected score for that student is over 12 and the probability of getting a score of 12 or higher is close to 60%. In addition, as a multiple measure students can be awarded up to 4 additional points based upon their responses on a survey that solicit information about students’ last high school English and math course and grade in that course, overall GPA, and time since high school.

It is recommended that an additional more robust and validated multiple measure be used when students score in the 12 point to 17 point range on the MDTP. Additional placement methods could include using recent high school math grades, non-cognitive assessments, or a longer, more reliable, placement test designed specifically for placement into intermediate algebra.

There is currently a plan in place to use recent math grades from local high schools for placement purposes on a pilot basis. There is also hope that this plan will help address some of the disproportionate impact found in the summer 2013 study.

In addition to the plan to use recent high school grades a short math refresher course will be available to students prior to taking the placement test. This refresher course known as “MathPlus” will allow students a leg up once they enroll in a math course and it will also give students a better opportunity to show their true math skills when taking a placement test. The MathPlus program will also be used to address the disproportionate impact found in the summer 13 study by targeting student groups that were found to be disproportionately impacted. These recommendations should be viewed as modest enhancements to our current system while waiting for the statewide Common Assessment Initiative (CAI) to complete its work over the next few years.