

COURSE PLACEMENT IN DEVELOPMENTAL MATHEMATICS: DO MULTIPLE MEASURES WORK?

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This brief is a product of a larger study, the main objective of which is to evaluate the effectiveness of math placement policies in the Los Angeles Community College District (LACCD) for entering community college students. The research was funded by a grant from the U.S. Department of Education's Institute for Education Sciences (IES).

SUMMARY

Using multiple measures during the community college placement process can increase student access to higher-level courses and also refine the accuracy of traditional placement tests. In this brief, we provide evidence that students who were placed into a higher-level course based on prior math background and high school GPA performed just as well as their peers. Given that course placement using these multiple measures does not hurt a student's chances of success, colleges should consider using these measures in addition to tests to determine placement in developmental math courses.

As open-access institutions, community colleges are tasked with providing educational opportunities for a diverse group of students. Yet at the same time, students are often unprepared for the demands of transfer-level work. In fact, it is estimated that over 60 percent of students nationally are placed in at least one developmental course (NCPPE & SREB, 2010). Although developmental courses can serve as necessary and helpful stepping-stones to success, they can also delay access to transfer-level courses (Bailey, Jeong, & Cho, 2010). Students placed in lower levels of the developmental math trajectory are less likely to enroll in and pass the prerequisite math courses needed to attain an associate's degree (Fong, Melguizo, & Prather, 2013). It is therefore critical to accurately assess and place students. Community colleges not only need to increase access to higher-level courses, but also place students on a trajectory of courses that maximizes opportunities for success.

MULTIPLE MEASURES IN CALIFORNIA

It is a common practice in community colleges across the U.S. to use placement tests to make initial math course placement decisions. Yet in California it has been deemed an unfair and

biased practice to make these decisions based only on standardized testing instruments.¹ According to Title 5 of the California Code of Regulations, California community colleges are required to use multiple measures of their choice to place students in developmental courses. These measures can include a student’s prior academic achievement, educational goals, or even motivation. This policy is based on the assumption that using multiple measures instead of a single assessment instrument will improve equity in the placement process and increase access for racial minority students.

We summarize the findings of a study that tested this assumption using data from seven of the nine colleges in the Los Angeles Community College District (LACCD) for which multiple measure information was available. During the placement testing process in LACCD, students provide additional information regarding their educational background or college plans. Colleges use this information to determine whether students should receive points in addition to their test score. In this brief, we call these additional points a *multiple measure boost*. Out of the seven colleges that we examined, two schools subtracted points for various responses. A student’s test score is combined with points from the multiple measure boost to determine placement level in developmental math. (See Kosiewicz, Melguizo, Prather, & Bos (2013) for an overview of assessment and placement policies).

In the study, we first calculated the number of students who benefitted from the use of multiple measures in each of the seven colleges between 2005 and 2008. Then we used data from two of the LACCD colleges that selected prior math background and high school GPA as multiple measures. An examination of course passing rates and credit completion showed that students who received a boost to a higher-level course based on these multiple measures were as successful as their peers.

METHODOLOGY

The students in the sample took placement tests and enrolled in a developmental math course between 2005 and 2008. We use Ordinary Least Squares (OLS) regression to compare the outcomes of students who were boosted into a higher-level course due to added multiple measure points with students whose test scores placed them directly into a course. We control for age, race, sex, and the number of additional points in the regression analyses.

¹ In 1991, the Mexican-American Legal Defense and Educational Fund (MALDEF) challenged the inequity of the Matriculation Act of 1986, which mandated placement testing as a part of enrollment and matriculation services in community colleges. The lawsuit claimed that the California Community College Chancellor’s Office failed to monitor appropriate use of placement tests, resulting in large proportions of Latino students being placed in remediation. The lawsuit was settled outside of court, but Title 5 of the California Code of Regulations was soon revised to mandate the use of multiple measures in placement decisions. The goal was to reduce the “disproportionate impact” of placement tests on different racial and ethnic groups.

METHODOLOGY CONT'D

These preliminary results are from two community colleges in LACCD: College A, which awards multiple measure points based solely on a student's prior math background, and College H, which awards multiple measure points based solely on a student's self-reported high school GPA. Since the multiple measure boost is determined by a single additional measure, we can determine the effectiveness and validity of that specific measure.

College A awards one point for each of the following prior math background measures: the highest level of math previously taken with a grade of C or better (+1 for trigonometry or higher), the number of years of math taken in high school (+1 for three years or more), the length of time since math was last taken (+1 if less than one year), and whether or not the student has taken algebra (+1). Students who take the placement test at College A can score a maximum of 120 points. College H awards two additional points for a high school GPA in the B to B- range, and four additional points for a high school GPA in the A to A- range. Students who take the placement test at College H can score between 40 and 50 points depending on the last subtest that they take.

USING MULTIPLE MEASURES INCREASES ACCESS

The use of multiple measures does increase the number of students placed into higher-level developmental education math courses in LACCD. The percentage of boosted students varies across colleges, ranging from zero to about 14 percent (see Table 1). Variation is likely due to the fact that each college uses different multiple measures with different point ranges. Overall, about 4.4% of students (1,458 out of 32,958 students) in seven of the LACCD colleges for which data are available were boosted up to a higher-level course between 2005 and 2008.

Table 1. Addition and Subtraction of Multiple Measure Points for Math Placement, LACCD 2005-2008

College	Point Range	Academic Background				College Plans	Motivation	Percent of Students Boosted Due to Multiple Measures
		Diploma or GED	HS GPA	Prior Math	Prior English			
A	0 to 3			+				4.4%
E	0 to 3		+					2.2%
B	0 to 3		+	+	+	+	+	0.9%
H	0 to 4		+					3.1%
J	-2 to 5	+		+ -			+ -	13.7%
D	0 to 2			+				3.7%
F	-2 to 2					+ -	+ -	0.8%
Overall: 4.4%								

Notes: (+) indicates measures for which points are added, and (-) indicates measures for which points are subtracted. College plans include hours planned to attend class, hours of planned employment, and time out of formal education. Motivation includes importance of college and importance of mathematics. Multiple measure information not available for two of the nine colleges.

STUDENTS PLACED IN HIGHER-LEVEL COURSES PERFORM AS WELL AS THEIR PEERS

Are students who are boosted to a higher-level course likely to be successful? It might be expected that students whose placement test scores are not high enough to merit placement into a higher-level course would be unsuccessful in those courses. Our findings from two of the LACCD colleges suggest the opposite: holding all else constant, lower-scoring students who received a multiple measure boost that placed them in a higher course performed no differently from their peers in terms of passing the first math course they enrolled in. They also showed no difference in the total number of degree-applicable and transfer-level credits they completed through spring 2012 (see Table 2).²

	Boost from:			
	Arithmetic to Pre-Algebra	Pre-Algebra to Algebra	Algebra to Int. Alg.	Int. Alg. to Transfer Math
Likelihood of passing the first math course with a...				
<i>Prior math boost</i>	Less	Same	Same	Same
<i>GPA boost</i>	Same	Same	Same	Same
Credit completion with a...				
<i>Prior math boost</i>	Same	Same	Same	Same
<i>GPA boost</i>	Same	Same	More	Same

The one exception is students who were moved up from the lowest level course (arithmetic to pre-algebra) based on prior math background. These students were less likely to pass their first math course. Information on prior math background may be the least relevant for this group of students. However, although they had a significantly lower probability of completing the higher-level course, there was no difference in eventual total credit completion. Interestingly, students who were boosted from algebra to intermediate algebra due to GPA completed *more* degree-applicable and transfer credits than their peers.

CONCLUSIONS

The results from two LACCD colleges suggest that using prior math background and high school GPA as multiple measures in the placement process increases access to higher-level math without decreasing a students' chances of success in the first math course in which they enroll or eventual credit accumulation.

Utilizing a multiple measure boost based on these measures can enable community colleges to increase access while ensuring student success in developmental math courses. This may also promote equity, accuracy, and even efficiency in the assessment and placement process. Boosting students into higher-level courses where they are likely to succeed can accelerate college completion as well as reduce the financial burden of postsecondary remediation.

² Degree-applicable math courses count towards a certificate or associate (A.A.) degree. Transfer level math courses are those above the intermediate algebra level and can be transferred to four-year colleges.

Given the evidence presented here, we recommend that community colleges utilize a similar placement process.³ We recommend the following practices:

- Consider a student's prior math background or high school GPA during assessment and placement in developmental math. Future research can explore the possibility of using both measures simultaneously.
- Validate multiple measures by comparing the outcomes of boosted students with peers placed at the same level. If the boosted students perform as well as their peers, the measure should be adopted for determining placement.
- Explore the extent to which other promising measures such as academic background, college plans, or motivation can be used to improve placement accuracy.⁴

³ Some information may not be available for older or international students.

⁴ These are currently under study as part of this project.

References

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