

MATH140/MATH180 Placement Analysis Follow-up Study2

Research Question – What are the average test score mean and standard deviation for each grade received in MATH140/180 of those who placed by the Calculus Placement Test (MDT4) after the cut score changes and the adding of trigonometry subscore requirement implemented on July 1, 2012?

Background

Calculus Placement Test (MDT4) – a testing instrument assesses students on the preparedness of algebraic and trigonometric skills for placement into the Calculus (MATH180) or Business Calculus (MATH140) college level courses. The current cut scores for course placements after most recent changes implemented on July 1, 2012, are:

Test Scores	Eligibility
0 - 29	You most likely will not be successful in Math 140/Math 180. Please take the College Level Math Placement Test to determine appropriate placement
30 - 60	MATH140
35 - 60	Math 180 (Beginning July 1, 2012, WITH qualifying trigonometry subscore of 4 or higher)

The following tables show the placement rates and repeats comparison prior and after the implementation of new eligibility rules. The overall placement rate into MATH180 has changed from 77.4% to 49.9%. The repeat rate of MDT4 testing has increased from 3.2% to 6.9%.

MDT4 Placement Eligibility	Prior Cut Score Change in 2012 (7/1/2009 to 6/30/2012)		Post Cut Score Change in 2012 (7/1/2012-2/4/2015)	
	#	%	#	%
Not Placed	266	13.4%	395	20.5%
MATH140	184	9.2%	572	29.6%
MATH180	1540	77.4%	964	49.9%
Duplicated Total	1990	100.0%	1931	100.0%

MDT4 Test Repeats	Prior Cut Score Change in 2012 (7/1/2009 to 6/30/2012)		Post Cut Score Change in 2012 (7/1/2012-2/4/2015)	
	#	%	#	%
None	1860	96.8%	1671	93.1%
One	58	3.0%	112	6.2%
Two or more	4	0.2%	11	0.7%
Unduplicated Total	1922	100.0%	1794	100.0%

Study Sample Selection

Students who satisfied the following conditions were included in the study:

1. Completed MATH140 or MATH180 with valid grades (A,B,C,D,F,I,W) on first attempt between fall 2012 and fall 2014, after being placed by MDT4 based on new eligibility rules.
2. The placement results of this group must be from the highest score of most recent MDT4 testing within the two year valid period prior their placed MATH140/180 enrollment.
3. No other college level courses, except for MATH110, should be taken between the MDT4 testing for placement and the first attempt of placed MATH140/180 course.

Results

The focus of this study is to find out students' MDT4 test scores in relation to the grades they received in placed courses. After filtering by selection criteria, the sample size of MATH140 for the study is much smaller than that of MATH180, possibly due to higher demand in MATH180. As indicated in the tables below, for both MATH140 and 180, students who received "A" or "B" grades tend to have higher mean MDT4 test scores. Similarly, in most cases, the higher the test scores students received, the better the success rates in placed courses.

MDT4 Test Score Mean and Standard Deviation by MATH140 Grade			
Grade	Count	Mean Test Score	Average Standard Deviation
A	29	41.966	7.292
B	22	40.455	8.651
C	14	37.071	7.478
D	7	36.143	6.149
F	19	38.737	7.585
IC	1	ND [^]	ND
W	19	37.632	6.865
Grand Total	111	39.297	7.619

[^]ND- not disclosed if N<=5.

MATH140 Course Success by Test Score Range	Enrolled Count	Success Count	Success Rate	"W" Grade Count
30-34	43	23	53.5%	7
35-39	15	5	33.3%	6
40-49	42	28	66.7%	4
50+	11	9	81.8%	2
Grand Total	111	66	58.0%	19

MDT4 Test Score Mean and Standard Deviation by MATH180 Grade			
Grade	Count	Mean Test Score	Average Standard Deviation
A	145	51.952	5.677
B	95	49.568	6.354
C	36	46.528	6.509
D	20	44.150	6.107
F	49	45.898	7.186
W	74	46.419	7.296
Grand Total	419	48.888	6.906

MATH180 Course Success by Test Score Range	Enrolled Count	Success Count	Success Rate	“W” Grade Count
35-39	54	19	35.2%	17
40-49	144	88	61.1%	29
50+	221	169	76.5%	28
Grand Total	419	276	65.9%	74