

De Anza College Office of Institutional Research and Planning

To: Math Department

From: Mallory Newell, De Anza Researcher

Date: 2/27/2018

Subject: Multiple Measures Analysis – Fall 2017

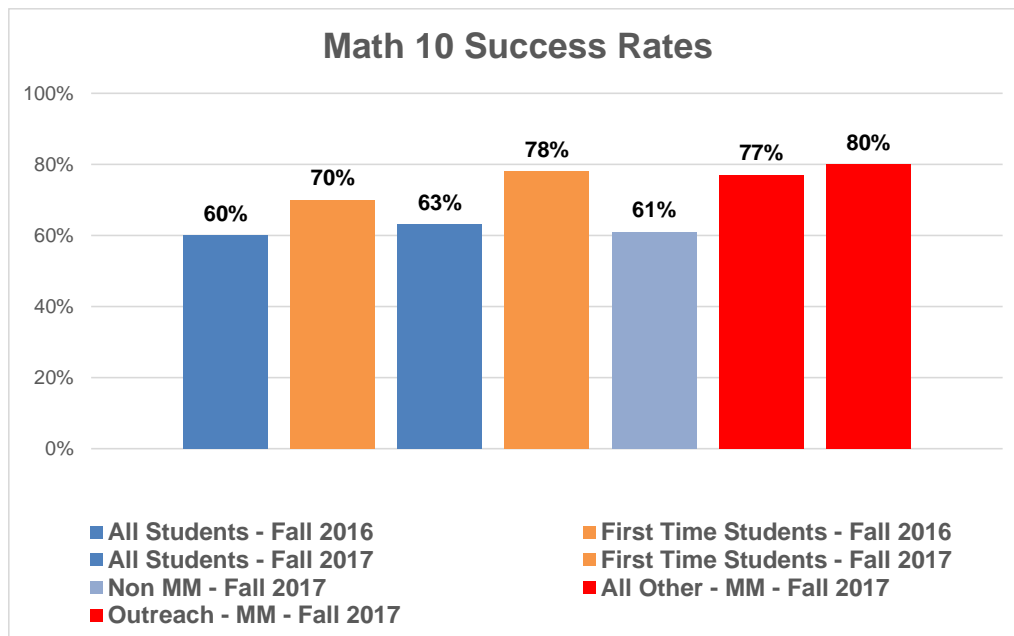
In fall 2017 the De Anza math department piloted the use of high school transcript data as a multiple measure (MM) for placement. The high school transcript model was applied to students assessed at their high school between March-May 2017 and to students who took a placement test and had a high school transcript available in CalPass Plus or submitted a high school transcript to De Anza between February 23 and October 6, 2017. 766 students were assessed using multiple measures at their high school, this is the 'Outreach' group, and 982 students tested at De Anza and had a transcript available for assessment, this is the 'All Other MM' group.

Highlights

- Of the students assessed by Outreach, 37% resulted in their test score being equal to their placement with high school transcripts. 40% the transcript placed them higher and 23% the transcript placed them lower.
- 49% of Outreach students and 38% of All Other MM test takers enrolled in a math class in fall 2017. This is compared to historical placement and enrollment rates in prior fall terms which ranged from 45% to 49%.
- In both MM student groups math course enrollment was lowest when the MM score was lower than the test score (25% of Outreach students and 26% of other students).
- The majority of students placed into math 212 (40% for both groups). Consistently, enrollment into MATH212 was the highest for all first-time students over the past 5 year (40% to 36%).
- Success rates for all MM students (79% to 70%) were higher than non-MM students (61% to 56%) in all math courses with the exception of MATH210 success rates (51% of MM students vs. 55% of non-MM students).
- All students enrolled in MATH10 in fall 2016 exhibited a success rate of 60%, compared to 63% the following term (including multiple measure students). This is compared to a success rate of 61% for students in fall 2017 who were not placed by multiple measures.
- The average persistence rate from fall 2017 to winter 2018 with multiple measures in place from MATH114 to MATH10 (or equivalent) was 43% compared to 35% the fall prior without multiple measures in place.
 - MATH212 to MATH114 was 51% compare to 44%
 - MATH210 to MATH114 was 38% compared to 43%
- Multiple measures assessment for students in the Outreach group had the most impact on Latino/a students.

- Fewer Latino/a students were placed into the lowest level, MATH210 via multiple measures than the test, 58% compared to 61%.
- This was also the case for MATH212, 43% compared to 46%
- More Latino/a students were placed into MATH114 by multiple measures than the test, 35% compared to 20%
- This was also the case for MATH10, 17% compared to 12%
- Targeted student populations placed through Outreach had lower success rates in all courses when compared to non targeted student groups, both placed with multiple measures.
 - Success rates for targeted students were highest in MATH10 and lowest in MATH210.

1. How did students do when placed into MATH10 using multiple measures?



- All students enrolled in MATH10 in fall 2016 exhibited a success rate of 60%, compared to 63% the following term when multiple measures assessment was used.
 - This is compared to a success rate of 61% for students in fall 2017 who were not placed by multiple measures.
- When looking at only first-time students in the past two fall terms, their rates were 70% and 78%.
- The students placed by multiple measures in fall 2017 exhibited success rates well above all other students and similar to or higher than first time students.

2. Where did students place based on the test or their transcript?

| Outreach MM Students | | |
|-------------------------|-------|------|
| MM Score vs. Test Score | Count | % |
| MM Score = Test Score | 286 | 37% |
| MM Score > Test Score | 306 | 40% |
| MM Score < Test Score | 174 | 23% |
| Total | 766 | 100% |

| All Other MM Students | | |
|-------------------------|-------|------|
| MM Score vs. Test Score | Count | % |
| MM Score = Test Score | 242 | 25% |
| MM Score > Test Score | 481 | 49% |
| MM Score < Test Score | 259 | 26% |
| Total | 982 | 100% |

- Of the students assessed by Outreach, 37% resulted in their test score being equal to their placement with high school transcripts. 40% the transcript placed them higher and 23% the transcript placed them lower. For students who tested at De Anza, 25% the test and transcript aligned, 49% placed higher with their transcript, and 26% placed lower.

3. How were students placed based on their ethnicity?

| | Placement Via Multiple Measures | Placement Via Test |
|------------------|------------------------------------|-----------------------|
| MATH10 | | |
| African American | 1% | 3% |
| Filipino/a | 14% | 14% |
| Latino/a | 17% | 12% |
| MATH114 | | |
| African American | 5% | 2% |
| Filipino/a | 7% | 11% |
| Latino/a | 35% | 20% |
| MATH212 | | |
| African American | 2% | 2% |
| Filipino/a | 7% | 11% |
| Latino/a | 43% | 46% |
| MATH210 | | |
| African American | 1% | 1% |
| Filipino/a | 8% | 6% |
| Latino/a | 58% | 61% |

Note: Only includes students placed in the Outreach group. N = 766.

- Multiple measures assessment for students in the Outreach group had the most impact on Latino/a students.
 - Fewer Latino/a students were placed into the lowest level, MATH210 via multiple measures than the test, 58% compared to 61%. This was also the case for MATH212, 43% compared to 46%
 - More Latino/a students were placed into MATH114 by multiple measures than the test, 35% compared to 20%. This was also the case for MATH10, 17% compared to 12%

4. What were the enrollment rates of students based on their placement method?

| Enrollment of MM Students | | | |
|---------------------------|------------------|-------------|------------|
| Group | Enrolled in | | % Enrolled |
| | Took a Math Test | Math Course | |
| Outreach | 766 | 377 | 49% |
| All Other MM | 982 | 372 | 38% |
| Total | 1,748 | 749 | 43% |

Placement tests taken between February 23, 2017 and October 6, 2017.

| Enrollment of all other students prior to MMAP | | | |
|--|------------------|---------------|------------|
| Term Enrolled | Enrolled in | | % Enrolled |
| | Took a Math Test | a Math Course | |
| Fall 2016 | 5,642 | 2,660 | 47% |
| Fall 2015 | 6,262 | 2,808 | 45% |
| Fall 2014 | 6,487 | 3,126 | 48% |
| Fall 2013 | 5,729 | 2,820 | 49% |

Test taken between February 1 through October 10 of each year.

- Of the 1,748 unique students who were assessed with multiple measures, 43% enrolled in a math class in fall 2017.
 - 49% of outreach students and 38% of all other test takers.
- This is compared to historical placement and enrollment rates in prior fall terms which ranged from 45% to 49%.

5. Of students that enrolled, how were they placed?

| Outreach Students | | |
|-----------------------------------|------------|-------------|
| MM Enrollment vs. Test Enrollment | Count | % |
| MM Score = Test Score | 149 | 40% |
| MM Score > Test Score | 133 | 35% |
| MM Score < Test Score | 95 | 25% |
| Total | 377 | 100% |

| All Other MM Students | | |
|-----------------------------------|------------|-------------|
| MM Enrollment vs. Test Enrollment | Count | % |
| MM Score = Test Score | 107 | 29% |
| MM Score > Test Score | 169 | 45% |
| MM Score < Test Score | 96 | 26% |
| Total | 372 | 100% |

- For both groups, enrollment in a math course was the lowest when the MM score was lower than the test score.

6. At what rate do students place into each math level?

| Fall 2017 Students | | | |
|--------------------|---------|----------|---------|
| Group | Course | Students | Percent |
| MM - Outreach | MATH10 | 82 | 20% |
| | MATH114 | 108 | 26% |
| | MATH212 | 165 | 40% |
| | MATH210 | 61 | 15% |
| Total | | 416 | 100% |
| MM - Other | MATH10 | 66 | 23% |
| | MATH114 | 66 | 23% |
| | MATH212 | 114 | 40% |
| | MATH210 | 39 | 14% |
| Total | | 285 | 100% |
| Non MM | MATH10 | 185 | 21% |
| | MATH114 | 173 | 19% |
| | MATH212 | 319 | 36% |
| | MATH210 | 215 | 24% |
| Total | | 892 | 100% |

Note: MM Other and Non MM include only first time students.
Many students enroll in more than one math course at a time.

- Enrollment into MATH212 was the highest for all three groups followed by MATH10.

7. How does this rate compare to overall enrollment rates by level?

| | Enrollment into Each Level - First-Time Students | | | | | | | | | |
|---------|--|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| | Fall 2013 | | Fall 2014 | | Fall 2015 | | Fall 2016 | | Fall 2017 | |
| | Students | Percent | Students | Percent | Students | Percent | Students | Percent | Students | Percent |
| MATH10 | 239 | 17% | 271 | 17% | 281 | 18% | 290 | 19% | 317 | 20% |
| MATH114 | 610 | 43% | 655 | 40% | 587 | 38% | 605 | 39% | 595 | 38% |
| MATH212 | 351 | 25% | 429 | 26% | 356 | 23% | 349 | 23% | 335 | 21% |
| MATH210 | 230 | 16% | 268 | 17% | 317 | 21% | 299 | 19% | 315 | 20% |
| Total | 1,430 | 100% | 1,623 | 100% | 1,541 | 100% | 1,543 | 100% | 1,562 | 100% |

- Enrollment into MATH10 increased slightly from 19% the prior fall to 20% in fall 2017 while enrollment into MATH114 decreased 1% from 39% to 38%, and MATH212 decreased from 23% to 21% and MATH210 increased 1% from 19% to 20%. But overall, course patterns were not changed drastically.

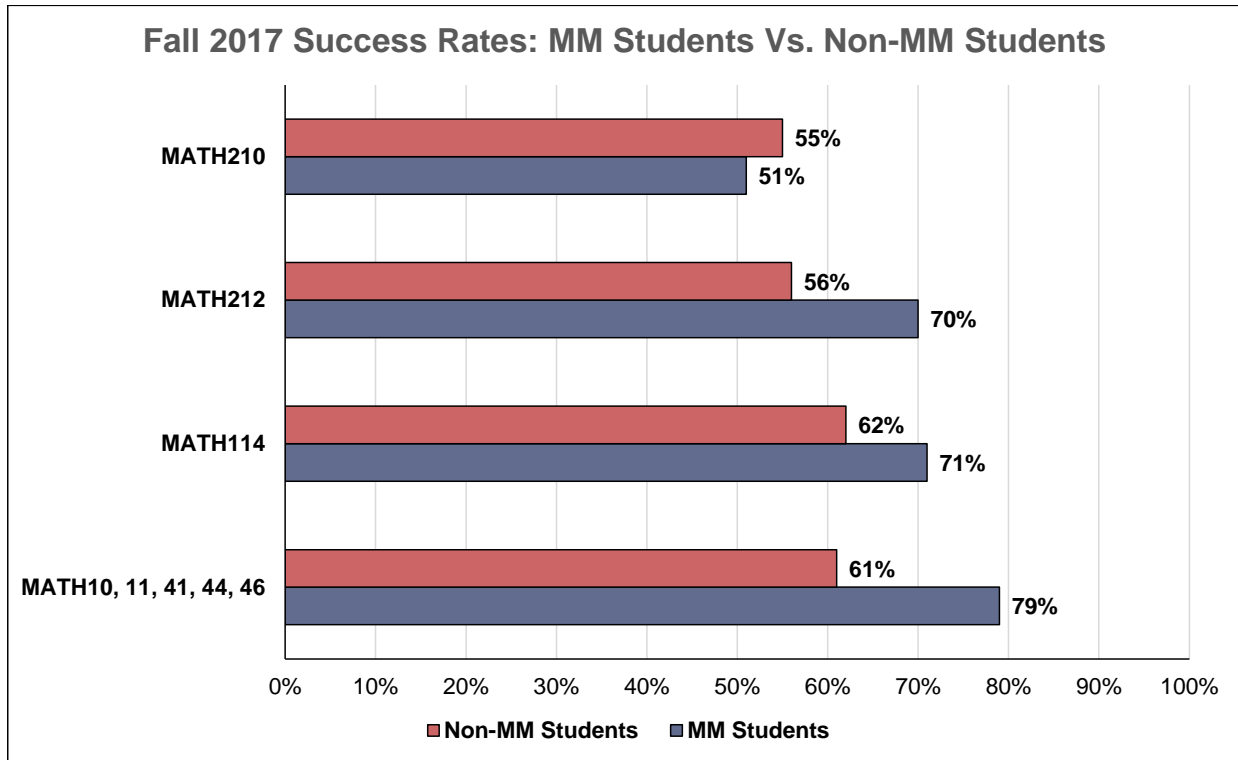
8. Where did students place via the test compared to multiple measures and how did they do?

| Test Score | MM Score | Count | Success | | Test vs. MM | |
|---------------------------|----------|-------|---------|------|-------------|------|
| MATH10, 11, 41, 44, 46 | MATH10 | 32 | 28 | 88% | Equal | 67% |
| | MATH114 | 8 | 7 | 88% | Test Higher | 33% |
| | MATH212 | 4 | 3 | 75% | Test Lower | 0% |
| | MATH210 | 4 | 2 | 50% | Total | 100% |
| Total | | 48 | | | | |
| MATH114 | MATH10 | 31 | 25 | 81% | Equal | 28% |
| | MATH114 | 21 | 19 | 90% | Test Higher | 32% |
| | MATH212 | 19 | 16 | 84% | Test Lower | 41% |
| | MATH210 | 5 | 3 | 60% | Total | 100% |
| Total | | 76 | | | | |
| MATH212, 217 | MATH10 | 52 | 46 | 88% | Equal | 13% |
| | MATH114 | 60 | 42 | 70% | Test Higher | 30% |
| | MATH212 | 26 | 20 | 77% | Test Lower | 57% |
| | MATH210 | 58 | 31 | 53% | Total | 100% |
| Total | | 196 | | | | |
| MATH210 | MATH10 | 11 | 7 | 64% | Equal | 48% |
| | MATH114 | 29 | 15 | 52% | Test Higher | 0% |
| | MATH212 | 9 | 2 | 22% | Test Lower | 52% |
| | MATH210 | 46 | 24 | 52% | Total | 100% |
| Total | | 95 | | | | |
| No Test Score | MATH10 | 1 | 1 | 100% | | |
| Total | | 1 | | | | |
| Total | | 416 | 291 | | | |

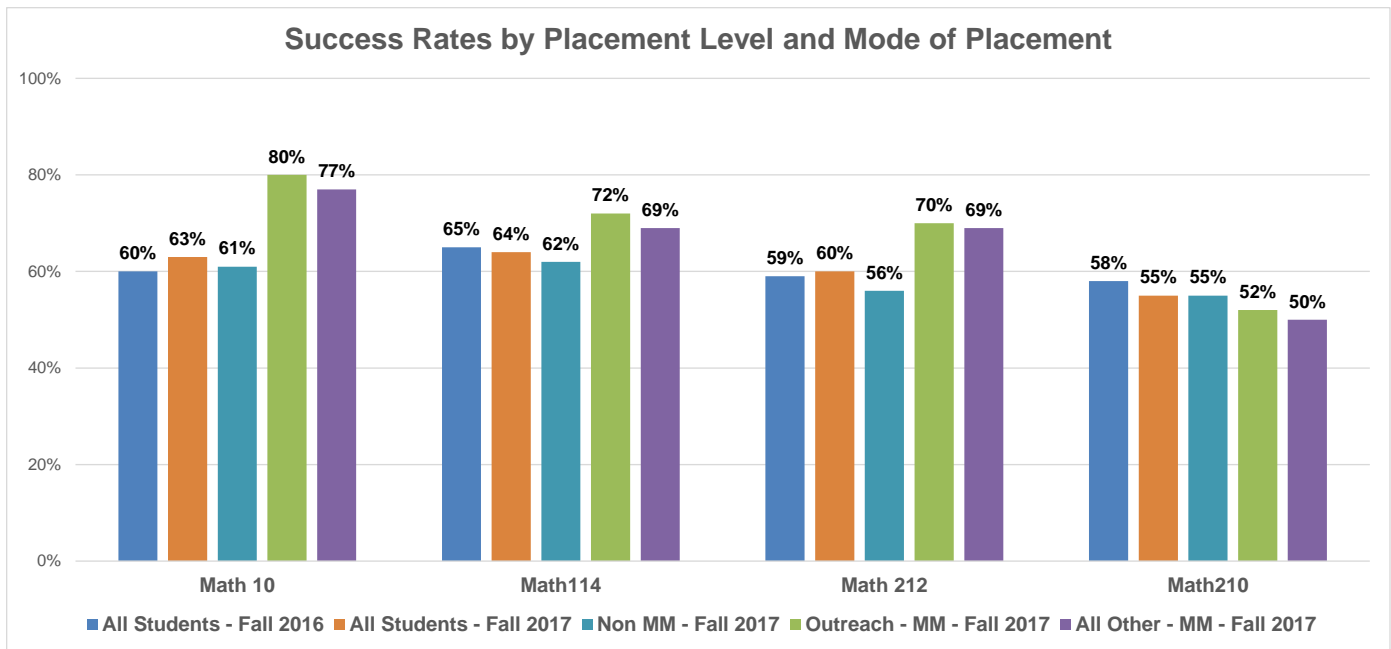
Note: Includes students placed via Outreach only.

- 48 students were placed into MATH10 via the test. 67% were given the same placement via multiple measures (32) while 33% the test placed them higher than their transcript did (16). Of the 48 students, 28 successfully completed MATH10 for a success rate of 88%.
- 76 students were placed into MATH114 via the test. 28% were given the same placement via multiple measures (21). 31 students were placed lower with the test than multiple measures (41%). Success rates of these students who were placed into MATH114 by the test but enrolled in MATH10 based on the multiple measure had a success rate of 81%.

9. What are the success rates of students placed by multiple measures compared to all math students?



- Overall, success rates in fall 2017 for students placed via multiple measures (796) was higher than students who were placed without multiple measures (3,883), with the exception of MATH210.



- Success rates in fall 2017 with multiple measures assessment compared to fall 2016 without multiple measures assessment were very similar or slightly higher, which is the intent of the multiple measures models, to maintain about current success rates in each level while increasing the rate at which student have access to higher level courses.
- Success rates for students who were placed without multiple measures in all courses, excluding MATH210, were significantly lower than students placed with multiple measures, between 14 and 10 percentage points.

| | Fall 2017 - All Other Non-MM Students | | | | | | | |
|------------------------|---------------------------------------|------------|-------------|------------|------------|------------|--------------|-------------|
| | Success | | Non Success | | Withdraw | | Total | |
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 990 | 61% | 306 | 19% | 325 | 20% | 1,621 | 100% |
| MATH114 | 557 | 62% | 217 | 24% | 124 | 14% | 898 | 100% |
| MATH212 | 511 | 56% | 276 | 30% | 122 | 13% | 909 | 100% |
| MATH210 | 252 | 55% | 153 | 34% | 50 | 11% | 455 | 100% |
| Total | 2,310 | 59% | 952 | 25% | 621 | 16% | 3,883 | 100% |

Note: MATH212 includes MATH217.

- When excluding students placed via multiple measures from all other students who took a math course in fall 2017, the success rates drop to 59% compared to 61%. Success rates in MATH10 drop from 63% for all multiple measures students to 61%, MATH114 drops from 64% to 62%, MATH212 drops from 60% to 56% and MATH210 stays flat at 55%.

Fall 2017 - All MM Students

| | Success | | Non Success | | Withdraw | | Total | |
|------------------------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 154 | 79% | 18 | 9% | 24 | 12% | 196 | 100% |
| MATH114 | 136 | 71% | 39 | 20% | 17 | 9% | 192 | 100% |
| MATH212 | 212 | 70% | 69 | 23% | 24 | 8% | 305 | 100% |
| MATH210 | 53 | 51% | 42 | 41% | 8 | 8% | 103 | 100% |
| Total | 555 | 70% | 168 | 21% | 73 | 9% | 796 | 100% |

Note: MATH212 includes MATH217.

- Success rates for all students placed with multiple measures was 70%. Success rates in MATH10 were 79%, MATH114 were 71%, MATH212 were 70% and MATH212 were 51%.

Fall 2017 - Outreach Multiple Measures Students

| | Success | | Non Success | | Withdraw | | Total | |
|------------------------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 66 | 80% | 8 | 10% | 8 | 10% | 82 | 100% |
| MATH114 | 78 | 72% | 23 | 21% | 7 | 6% | 108 | 100% |
| MATH212 | 115 | 70% | 41 | 25% | 9 | 5% | 165 | 100% |
| MATH210 | 32 | 52% | 23 | 38% | 6 | 10% | 61 | 100% |
| Total | 291 | 70% | 95 | 23% | 30 | 7% | 416 | 100% |

Note: MATH212 includes MATH217.

- Success rates for students placed using multiple measures via Outreach had an overall success rate of 70% in all four courses. Success rates in MATH10 were 80%, MATH114 were 72%, MATH212 were 70% and MATH2120 were 52%.

Fall 2017 - All Other Multiple Measures Students

| | Success | | Non Success | | Withdraw | | Total | |
|------------------------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 88 | 77% | 10 | 9% | 16 | 14% | 114 | 100% |
| MATH114 | 58 | 69% | 16 | 19% | 10 | 12% | 84 | 100% |
| MATH212 | 97 | 69% | 28 | 20% | 15 | 11% | 140 | 100% |
| MATH210 | 21 | 50% | 19 | 45% | 2 | 5% | 42 | 100% |
| Total | 264 | 69% | 73 | 19% | 43 | 11% | 380 | 100% |

Note: MATH212 includes MATH217.

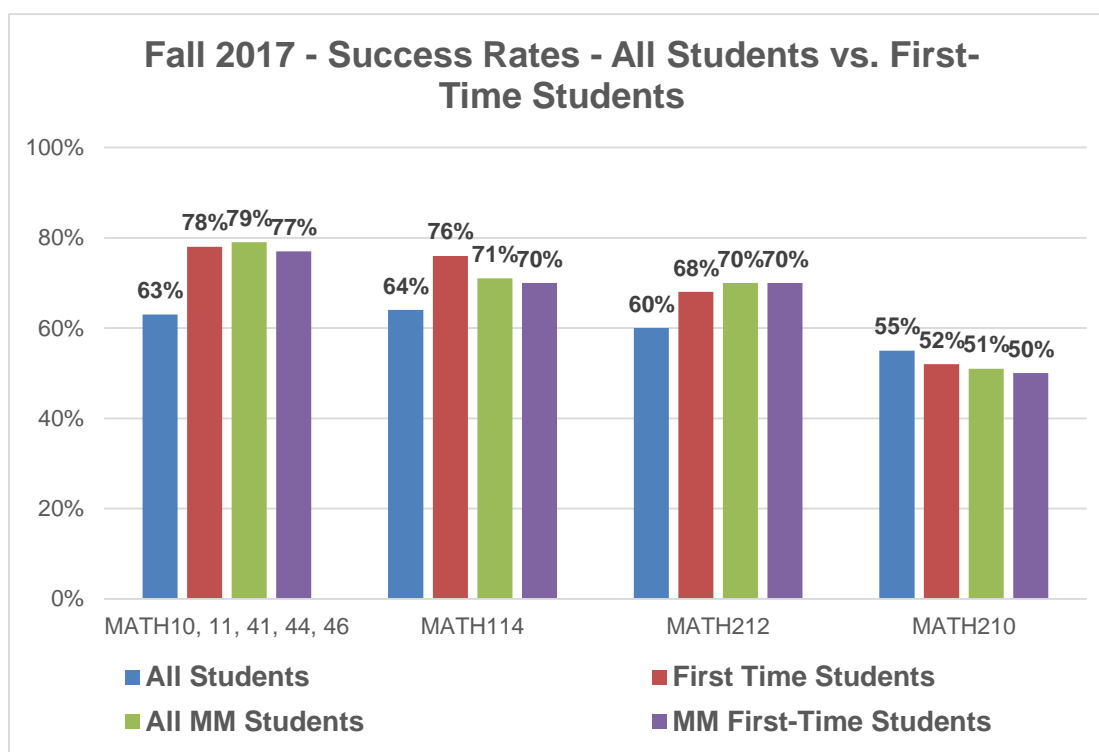
Fall 2017 - All Students

| | Success | | Non Success | | Withdraw | | Total | |
|------------------------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 1,144 | 63% | 324 | 18% | 349 | 19% | 1,817 | 100% |
| MATH114 | 693 | 64% | 256 | 23% | 141 | 13% | 1,090 | 100% |
| MATH212 | 723 | 60% | 345 | 28% | 146 | 12% | 1,214 | 100% |
| MATH210 | 305 | 55% | 195 | 35% | 58 | 10% | 558 | 100% |
| Total | 2,865 | 61% | 1,120 | 24% | 694 | 15% | 4,679 | 100% |

Note: MATH212 includes MATH217.

- In fall 2017, success rates for MATH10 for all students was 63% compared to 64% for MATH114, 60% for MATH212 and 55% for MATH210. Overall success rates for these four courses was 61%.

10. What are the success rates of students placed by multiple measures compared to all first-time math students?



- Students placed via multiple measures exhibited higher success rates when compared to all non-MM and all non-MM first-time students, with the exception of MATH210.

Fall 2017 - First Time Students

| | Success | | Non Success | | Withdraw | | Total | |
|-------------------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Non MM | 609 | 68% | 210 | 24% | 73 | 8% | 892 | 100% |
| MM - Non Outreach | 194 | 68% | 58 | 20% | 33 | 12% | 285 | 100% |
| MM - Outreach | 264 | 69% | 91 | 24% | 30 | 8% | 385 | 100% |
| Total | 1,067 | 68% | 359 | 23% | 136 | 9% | 1,562 | 100% |

Includes first-time students and first-time transfer students. MATH212 includes MATH217.

- First-time student success rates were included since the students in the Outreach group were first time students.

MATH10 - Fall Success Rates - All Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 1,129 | 64% | 321 | 18% | 324 | 18% | 1,774 | 100% |
| Fall 2014 | 1,186 | 63% | 378 | 20% | 333 | 18% | 1,897 | 100% |
| Fall 2015 | 1,208 | 66% | 358 | 20% | 257 | 14% | 1,823 | 100% |
| Fall 2016 | 1,073 | 60% | 374 | 21% | 341 | 19% | 1,788 | 100% |
| Fall 2017 | 1,144 | 63% | 324 | 18% | 349 | 19% | 1,817 | 100% |

MATH10 - Fall Success Rates - First Time Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 188 | 79% | 35 | 15% | 16 | 7% | 239 | 100% |
| Fall 2014 | 205 | 76% | 44 | 16% | 22 | 8% | 271 | 100% |
| Fall 2015 | 229 | 81% | 35 | 12% | 17 | 6% | 281 | 100% |
| Fall 2016 | 203 | 70% | 52 | 18% | 35 | 12% | 290 | 100% |
| Fall 2017 | 246 | 78% | 32 | 10% | 39 | 12% | 317 | 100% |

MATH114 - Fall Success Rates - All Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 780 | 60% | 349 | 27% | 165 | 13% | 1,294 | 100% |
| Fall 2014 | 787 | 59% | 366 | 27% | 178 | 13% | 1,331 | 100% |
| Fall 2015 | 701 | 58% | 321 | 27% | 179 | 15% | 1,201 | 100% |
| Fall 2016 | 792 | 65% | 260 | 21% | 172 | 14% | 1,224 | 100% |
| Fall 2017 | 693 | 64% | 256 | 23% | 141 | 13% | 1,090 | 100% |

MATH114 - Fall Success Rates - First Time Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 258 | 74% | 74 | 21% | 19 | 5% | 351 | 100% |
| Fall 2014 | 313 | 73% | 88 | 21% | 28 | 7% | 429 | 100% |
| Fall 2015 | 262 | 74% | 71 | 20% | 23 | 6% | 356 | 100% |
| Fall 2016 | 277 | 79% | 48 | 14% | 24 | 7% | 349 | 100% |
| Fall 2017 | 253 | 76% | 54 | 16% | 28 | 8% | 335 | 100% |

MATH212 - Fall Success Rates - All Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 969 | 63% | 406 | 26% | 167 | 11% | 1,542 | 100% |
| Fall 2014 | 875 | 61% | 413 | 29% | 145 | 10% | 1,433 | 100% |
| Fall 2015 | 822 | 65% | 290 | 23% | 153 | 12% | 1,265 | 100% |
| Fall 2016 | 764 | 59% | 342 | 26% | 198 | 15% | 1,304 | 100% |
| Fall 2017 | 723 | 60% | 345 | 28% | 146 | 12% | 1,214 | 100% |

MATH212 - Fall Success Rates - First Time Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 407 | 67% | 162 | 27% | 41 | 7% | 610 | 100% |
| Fall 2014 | 412 | 63% | 201 | 31% | 42 | 6% | 655 | 100% |
| Fall 2015 | 424 | 72% | 126 | 21% | 37 | 6% | 587 | 100% |
| Fall 2016 | 386 | 64% | 159 | 26% | 60 | 10% | 605 | 100% |
| Fall 2017 | 404 | 68% | 150 | 25% | 41 | 7% | 595 | 100% |

MATH210 - Fall Success Rates - All Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 358 | 62% | 150 | 26% | 71 | 12% | 579 | 100% |
| Fall 2014 | 352 | 54% | 218 | 34% | 78 | 12% | 648 | 100% |
| Fall 2015 | 372 | 62% | 181 | 30% | 49 | 8% | 602 | 100% |
| Fall 2016 | 353 | 58% | 184 | 30% | 70 | 12% | 607 | 100% |
| Fall 2017 | 305 | 55% | 195 | 35% | 58 | 10% | 558 | 100% |

MATH210 - Fall Success Rates - First Time Students

| | Success | | Non Success | | Withdraw | | Total | |
|-----------|---------|-----|-------------|-----|----------|-----|--------|------|
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Fall 2013 | 141 | 62% | 65 | 28% | 23 | 10% | 229 | 100% |
| Fall 2014 | 138 | 51% | 104 | 39% | 26 | 10% | 268 | 100% |
| Fall 2015 | 200 | 63% | 96 | 30% | 21 | 7% | 317 | 100% |
| Fall 2016 | 162 | 54% | 100 | 33% | 37 | 12% | 299 | 100% |
| Fall 2017 | 164 | 52% | 123 | 39% | 28 | 9% | 315 | 100% |

11. What are success rates of Outreach students by Targeted and Non Targeted groups?

| | MATH10 | | MATH114 | | MATH212 | | MATH210 | |
|--------------|---------|-----|---------|-----|---------|-----|---------|-----|
| | Success | | Success | | Success | | Success | |
| | Grades | % | Grades | % | Grades | % | Grades | % |
| Not Targeted | 42 | 82% | 43 | 81% | 38 | 85% | 8 | 67% |
| Targeted | 17 | 76% | 27 | 63% | 71 | 63% | 22 | 48% |
| Total | 59 | 80% | 70 | 72% | 109 | 70% | 30 | 52% |

Note: Includes only Outreach students, targeted are African American, Filipino, Latino/a, and Pacific Islander

- Targeted student population placed through Outreach had lower success rates in all courses when compared to non targeted student groups, both placed with multiple measures.
 - Success rates for targeted students were highest in MATH10 and lowest in MATH210.

12. What are the persistence rates of students placed by multiple measures?

| | Fall 2017 | | | | | | | | | | Fall 2016 | | |
|-------------------|-----------|-----|-------------|------------|-----|-------------|--------|-----|-------------|---------|-----------|-----|-------------|
| | Outreach | | | Other - MM | | | Non MM | | | Average | F16 | | |
| | F17 | W18 | Persistence | F17 | W18 | Persistence | F17 | W18 | Persistence | | F16 | W17 | Persistence |
| MATH114 - MATH10 | 92 | 46 | 50% | 84 | 38 | 45% | 898 | 308 | 34% | 43% | 1,224 | 432 | 35% |
| MATH212 - MATH114 | 157 | 96 | 61% | 140 | 72 | 51% | 909 | 373 | 41% | 51% | 1,304 | 572 | 44% |
| MATH210 - MATH114 | 58 | 21 | 36% | 42 | 17 | 40% | 455 | 173 | 38% | 38% | 607 | 260 | 43% |

Note: MATH10 includes 11, 41, 44, 46

- The average persistence rate from fall 2017 to winter 2018 with multiple measures in place from MATH114 to MATH10 (or equivalent) was 43% compared to 35% the fall prior without multiple measures in place.
 - MATH212 to MATH114 was 51% compare to 44%
 - MATH210 to MATH114 was 38% compared to 43%

Appendix A

The following tables are included as historical reference.

| | Fall 5-year Average - First Time Students | | | | | | | |
|------------------------|---|------------|--------------|------------|------------|-----------|--------------|-------------|
| | Success | | Non Success | | Withdraw | | Total | |
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 1,071 | 77% | 198 | 14% | 129 | 9% | 1,398 | 100% |
| MATH114 | 1,363 | 75% | 335 | 18% | 122 | 7% | 1,820 | 100% |
| MATH212 | 2,033 | 67% | 798 | 26% | 221 | 7% | 3,052 | 100% |
| MATH210 | 805 | 56% | 488 | 34% | 135 | 9% | 1,428 | 100% |
| Total | 5,272 | 68% | 1,819 | 24% | 607 | 8% | 7,698 | 100% |

*Fall 2013, 2014, 2015, 2016, 2017 - averages

| | Fall 5-year Average - All Students | | | | | | | |
|------------------------|------------------------------------|------------|--------------|------------|--------------|------------|---------------|-------------|
| | Success | | Non Success | | Withdraw | | Total | |
| | Grades | % | Grades | % | Grades | % | Grades | % |
| MATH10, 11, 41, 44, 46 | 5,740 | 63% | 1,755 | 19% | 1,604 | 18% | 9,099 | 100% |
| MATH114 | 3,753 | 61% | 1,552 | 25% | 835 | 14% | 6,140 | 100% |
| MATH212 | 4,153 | 61% | 1,796 | 27% | 809 | 12% | 6,758 | 100% |
| MATH210 | 1,740 | 58% | 928 | 31% | 326 | 11% | 2,994 | 100% |
| Total | 15,386 | 62% | 6,031 | 24% | 3,574 | 14% | 24,991 | 100% |

*Fall 2013, 2014, 2015, 2016, 2017 - averages