

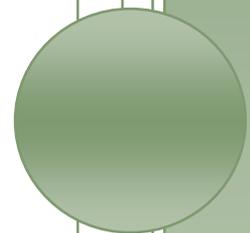
MULTIPLE MEASURES ASSESSMENT PROJECT (MMAP) AT NORCO COLLEGE

Fall 2016

MMAP at Norco

Office of Institutional Effectiveness

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Overview of MMAP

In Spring Semester 2016, Norco decided to become one of the pilot colleges for the Multiple Measures Assessment Project (MMAP). MMAP is a collaborative effort led by the RP Group and Cal-PASS Plus to develop, pilot, and assess implementation of a statewide placement model using multiple measures. MMAP is part of the larger Common Assessment Initiative with the objective of finding an assessment process that is more effective for student success. California Community Colleges have historically placed an inordinate amount of weight on a standardized test score to appropriately place students in English, math, reading, and ESL courses. To be clear, multiple measures (including grades in high school classes) have been used in conjunction with the standardized test in placing students for at least two decades. However, the standardized test score was by far the strongest influence in placing students. Now with MMAP, high school performance in courses has greater weight in placement than the test. Through extensive research at the state level it has been shown that this model of placement has greater validity and effectiveness than performance on a 1-2 hour placement test.

Fall 2016 was the first semester that Norco College implemented MMAP at a scale that generated data which could be used to decide whether full implementation would happen at the College. In addition, Norco College's award winning program, Summer Advantage was at a crossroads. Summer Advantage is a two week basic skills boot-camp that allows students to "show what they know" in a two-week faculty-facilitated workshop so they can be best placed in English or math. At the end of the workshop, final assessment of student work (usually a paper or test) determines the students "best-placed" level. As a result of this intervention many students moved up 1-3 levels in English or math from where the traditional process (i.e., standardized test) placed them, saving sometimes as much as a year or more of basic skills classes. Though the benefit to students was evident, this program required a lot of faculty time and college funds (some estimates as high as \$150,000-\$250,000). So the Summer Advantage workgroup was also interested in looking at MMAP results to determine if it could serve as the new method of finding students best placement. It should be noted that in addition to the workshops, Summer Advantage students received an extended full-day orientation, early registration, and wraparound services through their entire first year of enrollment including various academic success workshops and intrusive counseling.

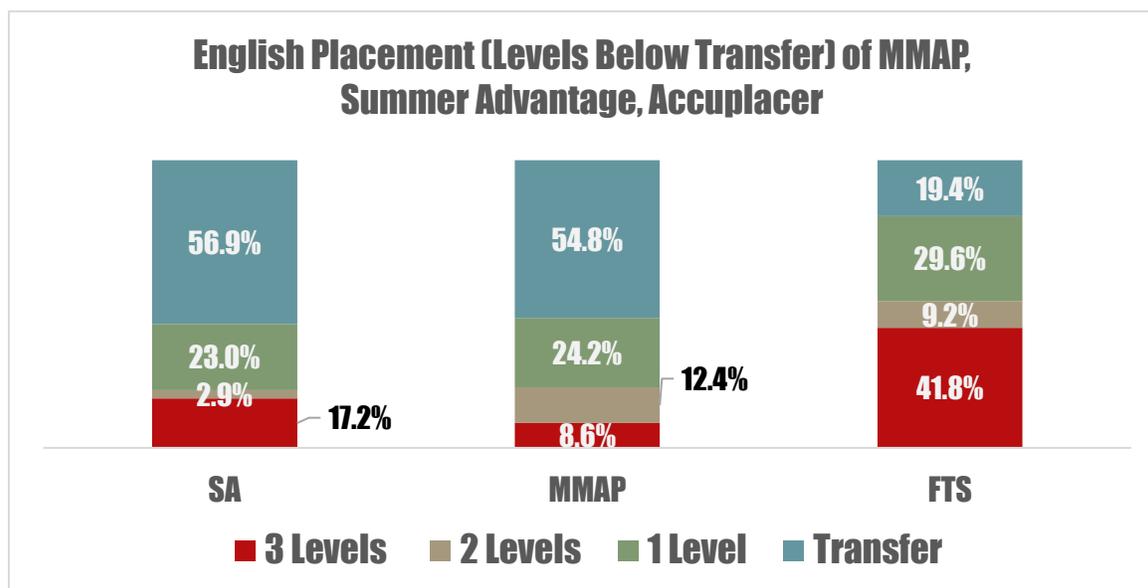
To determine the effectiveness of MMAP as a potential method for placing students at Norco College, a quasi-experimental research design was implemented. It was decided that three groups of students would be compared in this research study. Group 1 was the MMAP Group and these students would be included if 1) they took the entire assessment test anytime

between April 2016 and the beginning of August 2016, 2) they did not have prior English or math courses completed in the district, and 3) they had CalPASS data showing high school course work. Group 2 was the Summer Advantage Group, and these students were included if they completed the Summer Advantage program. Finally, Group 3 was the Accuplacer (placement test used at Norco) Group and these students would be included if 1) they took the assessment test before April 2016 or after the first week of August 2016, or 2) if they were originally part of the MMAP group, but did not have a match in CalPASS. The Accuplacer Group represented the placement process that has been in place for the last several decades. Although these groups were not randomly assigned, there should be little selection bias since all students were selected to participate in the MMAP based on when they participated in the assessment process. The only disqualifier for first-time college students (FTCS) to enter the MMAP group was whether they had a match in CalPASS. There is no known systematic reason for K-12 districts to submit or not submit data to CalPASS, so this disqualifier shouldn't have led to any drastic differences between groups. One difference that may exist, not in group assignment, but in length and intensity of student support is in the Summer Advantage intervention. Since the Summer Advantage program provided early enrollment, intensive workshops & counselor support for the entire first year of enrollment, outcomes need to be interpreted in consideration of these wraparound services. The only incentive that the MMAP Group received was priority registration for the fall 2016 only.

MMAP English Outcomes

The three groups involved in this placement study resulted in the following sample sizes: 418 students in MMAP (Group 1), 418 students in Summer Advantage (Group 2), and 814 FTCS students in the Accuplacer (Group 3). A comparison of placements results in levels below transfer for English are in Chart 1.

Chart 1. English Placement Comparison for MMAP, Summer Advantage, and Accuplacer



In terms of placement into transfer-level English, both MMAP (Group 1) and Summer Advantage (Group 2) were comparable at 54.8% and 56.9%, respectively. However, Group 3 placed by the traditional process (“Accu” in the chart) resulted in a 19.4% transfer-level English. The MMAP model and Summer Advantage Program almost tripled the percentage of students who were placed in transfer-level English which represented a huge shift of students from basic skills to college-level status. Comparing English placements in MMAP and Summer Advantage by number of levels advanced over Accuplacer, MMAP had a median shift up of one level whereas Summer Advantage had a median shift of two levels up from Accuplacer placement.

So although students shifted upward in English levels, the next analysis addresses whether this shift in MMAP placement was warranted and valid. This type of validity is analyzed by tracking MMAP students (Group 1) into English courses taken in fall 2016 that align with the placement recommendation. These students’ success rates are then compared to everyone else in the classes with them, regardless of how they got there (i.e. Accuplacer placement or completing the prerequisite). The assumption is that MMAP is a valid method of placement if Group 1 students perform in English or math courses as well or better than those arriving there by other paths. This involved analytic techniques including *t*-test of independent groups and analysis of variance (ANOVA). Groups 2 (Summer Advantage) and 3 (Accuplacer) were subject to the same analysis and results for all groups are available in Table 2 below.

Table 2. Success of MMAP, Summer Advantage, and Accuplacer Students in English

	Success	Percent	
MMAP Students (Group 1)	136/196	69.4%	Not significant (t=0.217, p>.05)
Comparison Group (Everyone else in classes with Group 1 students)	1315/1916	68.6%	
Summer Advantage English Workshop Completer (Group 2)	67/105	63.8%	Not significant (t=-0.510, p>.05)
Comparison Group (Everyone else in classes with Group 2 students)	780/1177	66.3%	
Accuplacer (Group 3)	285/418	68.2%	Not significant (t=-.0737, p>.05)
Comparison Group (Everyone else in classes with Group 3 students)	1479/2113	70.0%	

The top of Table 2 shows that MMAP students in comparison to all other students in the same classes with them were equally successful (69.4% & 68.6%, respectively). The same was the case with both the Summer Advantage group, as well as the No Intervention group. This suggests that MMAP is an equally valid method as Summer Advantage and/or Accuplacer for placement in English when using success as the outcome for comparison.

To determine if success rates between the groups (i.e. placement methods) varied significantly, an analysis of variance (ANOVA) was conducted on English success rates for each of the groups (MMAP-69.4%, Summer Advantage-63.8%, and No Intervention-68.2%). ANOVA results showed that differences between the three groups were not significant [$f(2, 717)=0.467, p=0.627$]. This

indicates that placement between the three groups had similar levels of success in English courses which supports the assertion that all of these placement methods have similar predictive validity.

Another level of analysis that provides MMAP comparison data on English success is through disaggregation at the course-level. Table 3 below compares student success rates between MMAP (Group 1) and all other students by English course. Keep in mind that groups smaller than 20 students are not likely to generate outcomes that are generalizable. Focusing on the courses that represent the major levels below transfer (English 60A, English 50, English 1A in yellow below), is helpful in fine tuning whether MMAP is placing students accurately at all English levels.

Table 3. Success Rates between MMAP and Other Students by English Course

Course	MMAP English Participant		Non-Participants	
	Count	Percent Successful	Count	Percent Successful
English-60A	25/36	69.4%*	180/236	76.3%
English-60B	14/19	73.7%	132/151	87.4%
English-50	41/62	66.1%*	351/530	66.2%
English-80	5/10	50.0%	81/156	51.9%
English-1A	50/67	74.6%*	531/790	67.2%
English-1AH	1/1	100%	25/25	100%
English-1B	0/1	0%	15/28	53.6%
Total	136/196	69.4%	1315/1916	68.6%

* T-test results showed that difference between MMAP and Non-Participant group was NOT significant

Results of this subanalysis indicated that even when disaggregated by course there was not a disproportionate success outcome for one course over another. This is encouraging news which again leads us to assume that MMAP is equally effective for placement at all levels of English.

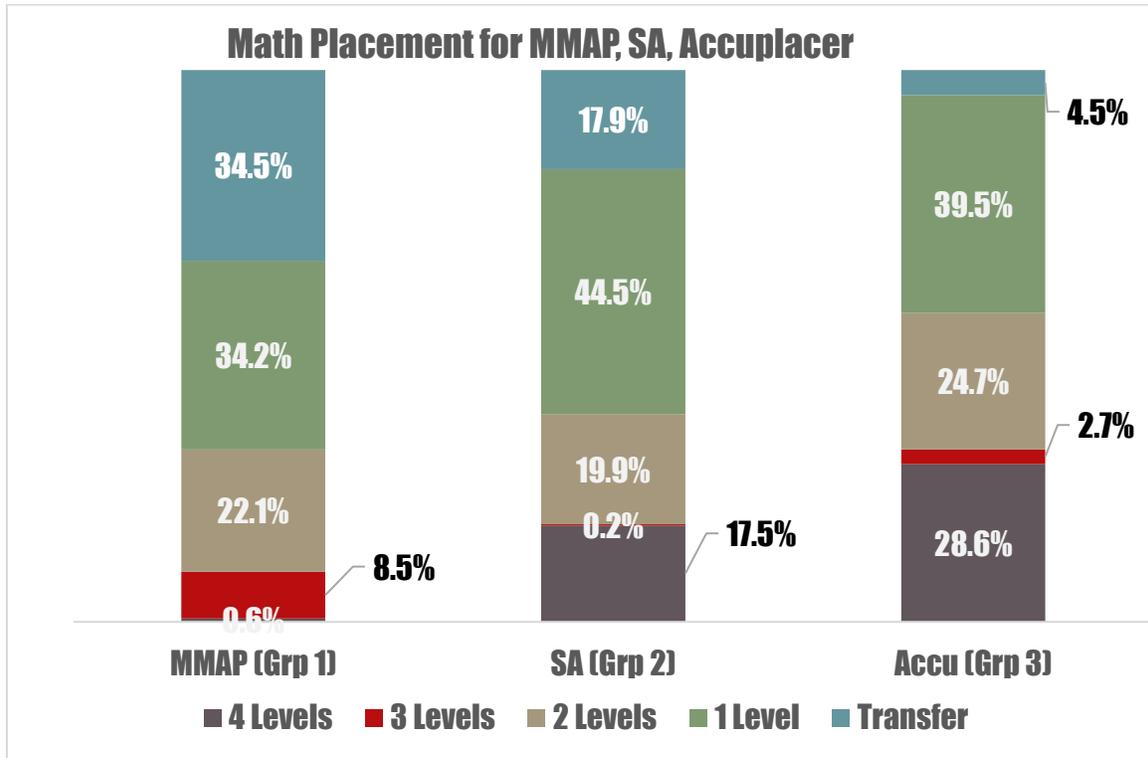
MMAP Math Outcomes

The following analysis will mirror the same approach taken to evaluate the three placement methods-MMAP, Summer Advantage, Accuplacer but will be used to examine the outcomes and validity of MMAP for math placement. The same three groups, with the same selection criteria, were used to study MMAP math students. The only difference in math placement from English is in the number of levels students can be placed below transfer, and in the number of levels above transfer. Due to higher level STEM math courses including trigonometry, precalculus, and calculus, each course in the preceding list could be characterized as increasing in “levels above transfer”. To minimize confusion on this, all math courses that are transferable are grouped into the transfer-level math category.

Chart 4 below shows placement results of the three groups in levels below transfer. Math exhibited a stair-step pattern when comparing the three groups in transfer-level distribution of placement. By far, the group with the highest transfer-level placement for math was the MMAP

(Group 1) group at 34.5%. This was almost double the placement of the next highest group, Summer Advantage, at 17.9% transfer-level placement. The lowest transfer-level placement was the Accuplacer group which was 4.5% transfer-level math placement. This low transfer-level percentage has been consistently in the 4%-5% range for incoming students using Accuplacer at Norco College.

Chart 4. Math Placement Comparison for MMAP, Summer Advantage, and FTCS



One factor to keep in mind for interpreting the disproportionately high placement into transfer-level math for Summer Advantage is that students in this program were directed to remediate the area of greatest need. In other words, students with higher math placement were directed to remediate English for their two-week workshop. Whereas, students with lower math placement were directed to remediate math for their workshop, and these students had the opportunity to increase their level in math as a result. This process of selecting workshops for the students may have directed attention mostly to lower-placed math students and this may have accounted for the shift which was less than the MMAP placed students (who were not subjected to a selection process). A more accurate comparison is probably between the MMAP and Accuplacer (Accu) groups. The MMAP group was almost eight times the percentage of the Accu group which is a profoundly large shift of students placing into transfer-level math. In comparing the median shift in levels, MMAP shifted students up one level, whereas Summer Advantage had zero levels as its median shift from Accuplacer placement.

The next step in the analysis of placement outcomes compares success rates for students taking math in fall 2016 who were placed by MMAP, Summer Advantage, or Accuplacer. Table 5 below

compares success rates of students in Group 1 (MMAP), Group 2 (SA), and Group 3 (Accuplacer) against the success rates of all other students in the same classes with them.

Table 5. Success of MMAP, Summer Advantage, and Accuplacer Students in Math

	Success	Percent	
MMAP Math (Group 1)	118/205	57.6%	Difference not significant (t=0.437, p>.05)
Comparison Group (Everyone else in classes with Group 1 students)	1719/2906	59.2%	
Summer Advantage Math Workshop Completer (Group 2)	117/195	60.0%	Difference not significant (t=-0.448, p>.05)
Comparison Group (Everyone else in classes with Group 2 students)	1534/2491	61.6%	
Accuplacer (Group 3)	304/512	59.4%*	Significant (t=-2.876, p<.01), Cohen's d=0.133195
Comparison Group (Everyone else in classes with Group 3 students)	2145/4066	52.8%	

When analyzing for significant differences using the *t*-test for independent groups, MMAP (Group 1) and Summer Advantage (Group 2) did not show significantly different success rates when comparing against students in the same math classes with them. However, the Accuplacer group (Group 3) did have a significantly higher success rate than all other students in classes with them. These results indicate that MMAP and Summer Advantage are placing students at levels adequate for their success in their respective classes. However, the Accuplacer group's results indicated that they were placed too low, and were therefore over prepared for the courses they were directed to take.

To determine if significant differences in success rates existed between the three groups (Group 1-57.6%, Group 2-60.0%, Group 3-59.4%), an ANOVA was conducted. The results showed no significant differences between the three groups' math success rates [$f(2, 901)=0.206, p=0.814$]. This indicates that the students who were placed by these three methods performed equivalently well in the courses in which they were placed during fall 2016.

The final analysis for MMAP math placement was to conduct a subanalysis of success rates by course. As with the English analysis of the same type, all success rates will be displayed but only courses with an MMAP group of 20 students or higher will be tested to see if significant differences exist in comparison to other students in the same classes. Table 6 below displays the success rates of MMAP students and those in the same classes for all math course enrollments during the semester. The courses that are highlighted in yellow are the groups that were comprised of at least 20 students and were analyzed for significant differences between groups. As noted in the table, there were not significant differences in any math course between success rates for MMAP students and other students in the same. One difference between math and English is that there are many transfer courses in math, whereas only one course in English. This creates a gap in our analysis since none of the transfer math courses have 20 students to meet the requirement for significance testing. To compensate for this, all

transfer math courses were combined (Math-36 and below on Table 6) and significance testing was applied to the transfer-level math group. The success rates for transfer-level math between MMAP and the other students were 68.2% and 68.1%, respectively, and this was not a significant difference ($t=.015$, $p=.988$). This lack of significance is encouraging for reasons similar to those mentioned for English, namely, that MMAP appears to maintain appropriate placement regardless of the number of levels below transfer and at transfer-level.

Table 6. Success Rates between MMAP and Other Students by Math Course

Course	MMAP Math Participant		Non-Participants	
	Count	Percent Successful	Count	Percent Successful
Math-64	4/5	80.0%	45/65	69.2%
Math-65	17/27	63.0%*	215/370	58.1%
Math-52	22/38	57.9%*	345/554	62.3%
Math-53	2/7	28.6%	92/129	71.3%
Math-35	43/84	51.2%*	521/1052	49.5%
Math-36	10/11	90.9%	139/207	67.1%
Math-10	11/16	68.8%	128/166	77.1%
Math-11	3/5	60.0%	53/81	65.4%
Math-12	6/11	54.5%	150/238	63.0%
Math-1A	0/1	0%	31/44	70.5%
Total	118/205	57.6%	1719/2906	59.2%

* T-test results showed that difference between MMAP and Non-Participant group was NOT significant

Summary

The focus of this study was the comparison of the MMAP method of placement to Summer Advantage and Accuplacer. Several outcomes were compared for each method: 1) distribution of placements in levels below transfer, 2) success rates between students of each placement and all other students in courses with them during fall 2016, 3) success rates between each of the three placement methods, and 4) success rates between students of MMAP placement and other students in courses with them disaggregated by course. The results of each of these analyses indicated that MMAP & Summer Advantage increased the percentage of students placed in transfer-level English and math. Also, when following students to English and math courses taken in fall 2016 and comparing success rates between them and other students in the class there were no significant differences (i.e. placement methods) in English. In math there were no significant differences for MMAP or Summer Advantage, but the Accuplacer group was significantly higher in success rates. When comparing each of the placement methods against each other in success rates, there were no significant differences in success for English and math between the three groups. Finally, when disaggregating MMAP success rates by course neither English or math showed any differences in any of the placement methods when compared to everyone else in the course. All of these results, strongly suggest that MMAP is an appropriate method of placement in English and math at Norco College.