MULTIPLE MEASURES 2016 PILOT, BRIEF UPDATE

B.Todhunter, Office of Research, Planning, and Grants

SWEETWATER UNIFIED HIGH SCHOOL DISTRICT DATA

SUMMARY OF SUHSD DATA

Upon request and with much appreciation, Sweetwater Unified High School District provided us with a list of their 2016 graduating class. This consisted of 6,750 students, 2,295 of whom matched with Southwestern College records by SSN or through a name and birthday matching process. Five-hundred thirty-one of these students participated in the multiple measures pilot study that took place during the Fall 2016 testing period (May 23rd – June 18th, 2016); 455 received English placement testing, 462 received Reading placement testing, and 493 received Math placement testing, with 425 of the students (80%) receiving all three test assessments and placements. Table 1 displays gender, ethnicity, and ESL status of these students.

Sweetwater Demographics Multiple Measures Pilot Study (N = 531)		
	%	*n*
Gender		
Male	56.7%	301
Female	43.3%	230
Ethnicity		
African-American, Non-Hispanic	4.00%	21
American Indian/ Alaskan Native	▮	▮
Asian	▮	▮
Filipino	8.50%	45
Hispanic	75.1%	399
Other, Non-White	▮	▮
Pacific Islander	▮	▮
White, Non-Hispanic	7.50%	40
No Response/Unknown	▮	▮
English as a Second Language		
No/Unknown	65.5%	348
Yes	34.5%	183

Table 1: Gender, Ethnicity, and ESL status as reported by SUHSD 2016 graduates that participated in the MM 2016 pilot study.

SUHSD DATA ACCURACY

The previous report on the 2016 MM pilot study used self-reported measures to place students into the corresponding course levels. For example, students reported their high school GPA, and if this self-reported GPA was ≥ 2.5, students were placed into English 115. With access to student records from SUHSD, we were able to determine the accuracy of this self-reported data.

In regards to HS GPA, 148 students misreported their GPA (27.9%), with 17.5% over reporting their GPA (n = 93) and 10.4% under reporting their GPA (n = 55). However, these disparities could be due to differences in which GPA the student was reporting (we only have access to the Overall Weighted GPA), and due to the imprecisely defined GPA bands collected in the self-report questionnaire. In fact, only 3.8% of students reported a GPA more than one band category away from their SUHSD GPA, with 2 students under reporting their GPA by more than one band and 18 students over reporting their GPA by more than one band.

When looking at last grade received in an English course, 23.7% (n = 126) of students did not accurately report the grade received in their last semester of high school English. However, only 6.2% of students reported a passing grade (A, B, or C) in their last English course when they did not pass a 12th grade English course. Similarly, for Math grades, 29% (n = 154) of students reported a grade for their last math class that did not correspond to their last grade from SUHSD records. However, 5.6% (n = 30) reported a non-passing grade when they did actually pass a 12th grade Math class, and only 4.1% (n = 22) reported a passing grade in their last math course when they did not actually pass a 12th grade math course.

ENGLISH

From the 455 students that underwent test assessment and placement for English, 74.9% (n = 341) were placed into English 115, 20.7% were placed into English 114 (n = 94), and 4.4% (n = 20) were placed into English 71/99. In this analysis, we will focus on the students placed into English 115. Of the 341 students placed into English 115, 39.9% (n = 136) received the placement from current test assessment procedures, and 60.1% (n = 205) were placed up into English 115 from their HS GPA (≥ 2.5). A total of 239 students (70.1%) enrolled in English 115 in the Fall 2016 semester. Course outcomes for each group are displayed in Figure 1.

English 115 Course Outcomes
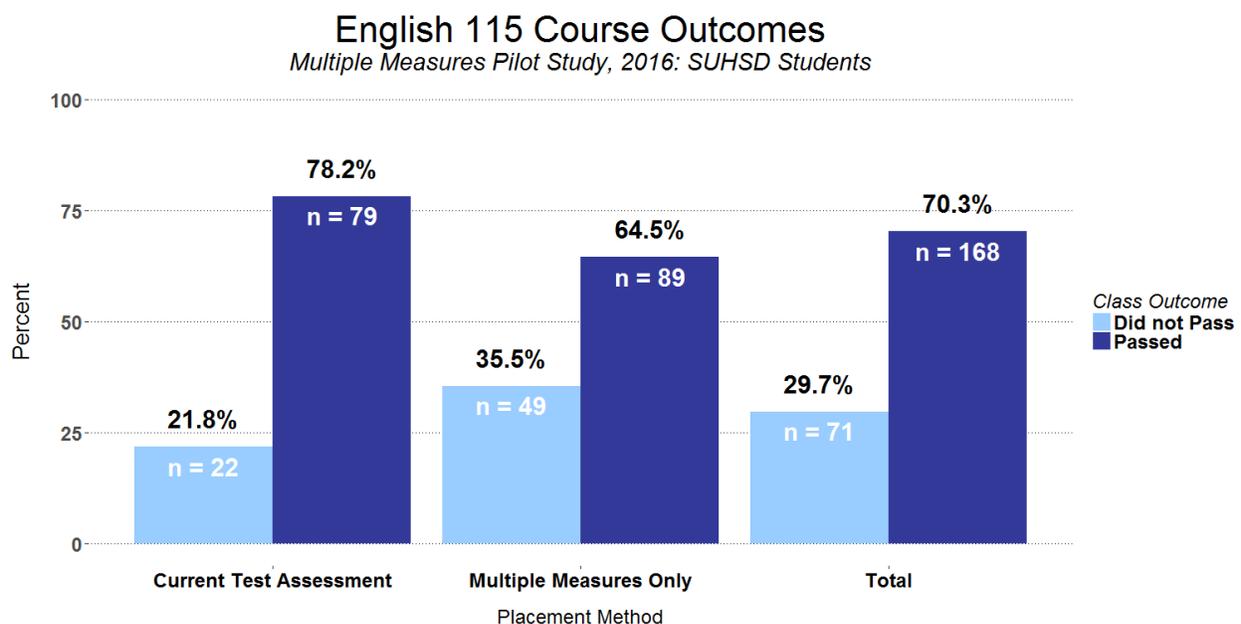*Multiple Measures Pilot Study, 2016: SUHSD Students*

Figure 1: English 115 Course Outcomes between those placed using current test assessment procedures and those placed up into English 115 from the multiple measures only approach. Combined, students in this sample had a 70.3% pass rate.

We find that students placed up from multiple measures are significantly less likely to pass English 115 than those placed from current test assessment practice, $\chi^2(1, N = 239) = 4.624$, $p = .031$. However, the combined pass rate (70.3%) is not significantly different from English 115 pass rates in Fall 2014 and 2015, $\chi^2(2, N = 512) = 2.986$, $p = .225$ [see initial Multiple Measures Pilot report, pg. 9].

ENGLISH: COURSE OUTCOME PREDICTION

To equalize odds of success for all students, we will perform predictive analyses to understand what student factors may relate to success in English 115. This will include data provided to us from SUHSD, such as overall weighted GPA, whether the student took an AP

English course in their senior year, and the best grade received in a 12th grade English class. In addition, we will use data obtained from SWC's assessment procedures, including test results from the College Test for English Placement (CTEP) and whether the student reported English as a second language.

Results indicate that high school GPA is only a marginally significant predictor of English 115 performance (p = .064) when controlling for the other variables in the model. Those who reported English as a primary language had a 90% increased odds of passing English 115 compared to those that reported English as a secondary language or did not respond to the question (p = .047). In addition, those that had a letter grade of "A" within a 12th grade English course had a 5.87 times increased odds of passing English 115 compared to those with a grade of C or below (p < .001), and those with a English grade of "B" within 12th grade, had 2.95 times increased odds of passing English 115 compared to those with an English grade of C or below (.024). Factors that do not appear to be related to success in English 115 are CTEP scores or whether the student took an AP English course in their senior year, although only a small number of students within this sample had taken an AP English course in their senior year. Finally, we were unable to find any significant interactions between the variables included in this model. The results suggest receiving an A or B in a 12th grade English class is predictive of English 115 success, however these results should be replicated in larger samples; only 26 students did not receive above a "C" in their 12th grade English class.

RECOMMENDATIONS FOR ENGLISH PLACEMENT

Predictive analytics and graphical evidence indicate the best placement guidelines to maximize English 115 placement and pass rates are as follows:

1. A placement regression score ≥ 3.06 [current test assessment & placement guideline]
   OR
2. A placement regression score ≥ 2.4 and an A or B in a 12th grade English course
   OR
3. A high school GPA ≥ 2.7

Outcomes following English Placement Proposed Guidelines

	Test Assessment Placed	Additional MM Placed	*Total*
Placement at English 115	136	170	306
Enrolled in English 115	101	121	222
Did not Pass English 115	22	37	59
Passed English 115	79	84	163
% Passed	**78.2%**	**69.4%**	**73.4%**

Table 2: English 115 course outcomes if revised placement methods had been implemented in 2016 MM pilot study [among SUHSD students].

READING

From the 462 students that received Reading test assessment and placement, 43.5% (n = 201) were placed at Reading Proficiency, 49.8% (n = 230) were placed into Reading 158, 1.5% (n = 7) were placed into Reading 56, 3.5% (n = 16) were placed into Reading 54, and 1.7% were placed into Reading 52 (n = 8). For these analyses, will focus on students placed into Reading 158. Of the 230 students placed into Reading 158, 61.3% (n = 141) received the placement from current test assessment procedures, and 38.7% (n = 89) were moved up into Reading 158 from multiple measures guidelines (HS GPA ≥ 2.0). Ninety-one (39.6%) of the students placed at Reading 158 enrolled in the course in the Fall 2016 semester. Due to this small number, analyses are limited and results are presented with caution. Reading 158 course outcomes are presented in Figure 2.

Reading 158 Course Outcomes
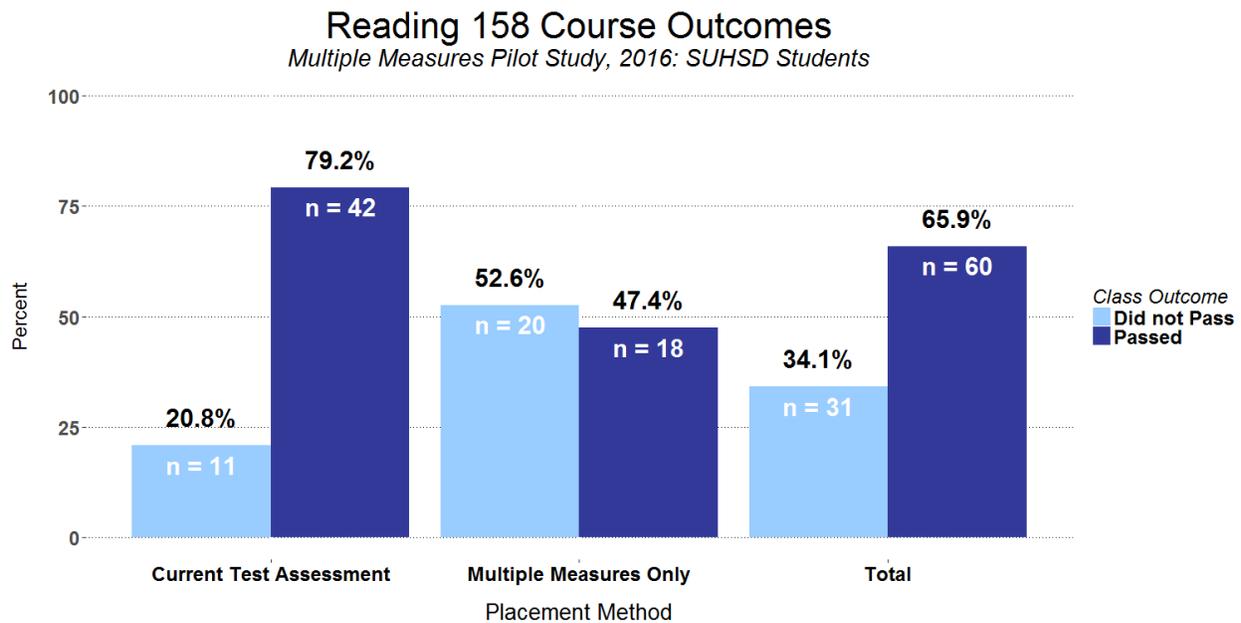### Multiple Measures Pilot Study, 2016: SUHSD Students

Figure 2: Reading 158 Course Outcomes between those placed using current test assessment procedures and those placed up into Reading 158 from the multiple measures only approach. Combined, students in this sample had a 65.9% pass rate.

We find that students placed using current test assessment procedures were significantly more likely to pass Reading 158 compared to those placed up from multiple measures, $\chi^2(1, N = 91) = 8.644$, $p = .003$. In addition, the combined pass rate for students placed during the MM pilot is significantly lower than seen in previous years, $\chi^2(2, N = 335) = 7.285$, $p = .026$ [see initial MM pilot report, pg.16].

READING: COURSE OUTCOME PREDICTION

Due to the small sample size, only three variables were used for Reading 158 course prediction: HS GPA, whether the students passed a 12th grade English class, and CTEP Reading scores. Results indicate that both HS GPA and CTEP Reading scores are significant predictors of success in Reading 158. For every one unit increase in HS GPA (e.g. from a 2.0 to a 3.0), students have an approximately 3.4 times greater likelihood of course success (p = .017). Also, for every one point increase in CTEP Reading score, students increase their odds of success in Reading 158 by 15.6% (p = .028). Passing a 12th grade English course did not have a detectable relationship with likelihood of course success. In this sample, there is no evidence of an interaction between HS GPA and CTEP Reading Scores.

RECOMMENDATIONS FOR READING PLACEMENT

Based on these predictive analyses and graphical evidence, a recommended placement would be as follows:

1. HS GPA ≥ 2.6
   OR
2. CTEP Reading Score ≥ 14

If those placement guidelines had been used in the 2016 MM pilot study, the results would as follows:

Outcomes following Reading Placement Proposed Guidelines

	Test Assessment Placed	Additional MM Placed	*Total*
Placement at Reading 158	141	73	214
Enrolled in Reading 158	53	30	83
Did not Pass Reading 158	11	13	60
Passed Reading 158	42	17	59
% Passed	**79.2%**	**56.7%**	**71.1%**

Table 3: Reading 158 course outcomes if revised placement recommendations had been implemented during 2016 MM pilot study [among SUHSD students].

MATH

Of the 493 students that underwent test assessment and placement for Mathematics, the majority (n = 218 [44.2%]) were placed at the Math 70 level (also includes Math 100, 110, 112). At the college-level, 16.8% (n = 83) were placed at the first transfer level (includes classes like Math 101 and Math 121), and 16.6% (n = 82) were placed at the Math 250 level; combined, this results in 33.5% (n = 165) being placed at transfer/college-level Math. All students placed at the college-level were done so through multiple measures only placement, and likewise, 96.8% (n = 211) of the students placed at the Math 70 level were done so through multiple measures only placement. Therefore, we do not have a fair comparison between students placed into one-level-below transfer and transfer level math courses from current test assessment procedures and multiple measures only placement. The outcomes of these students are presented in Figure 3 and Table 4.
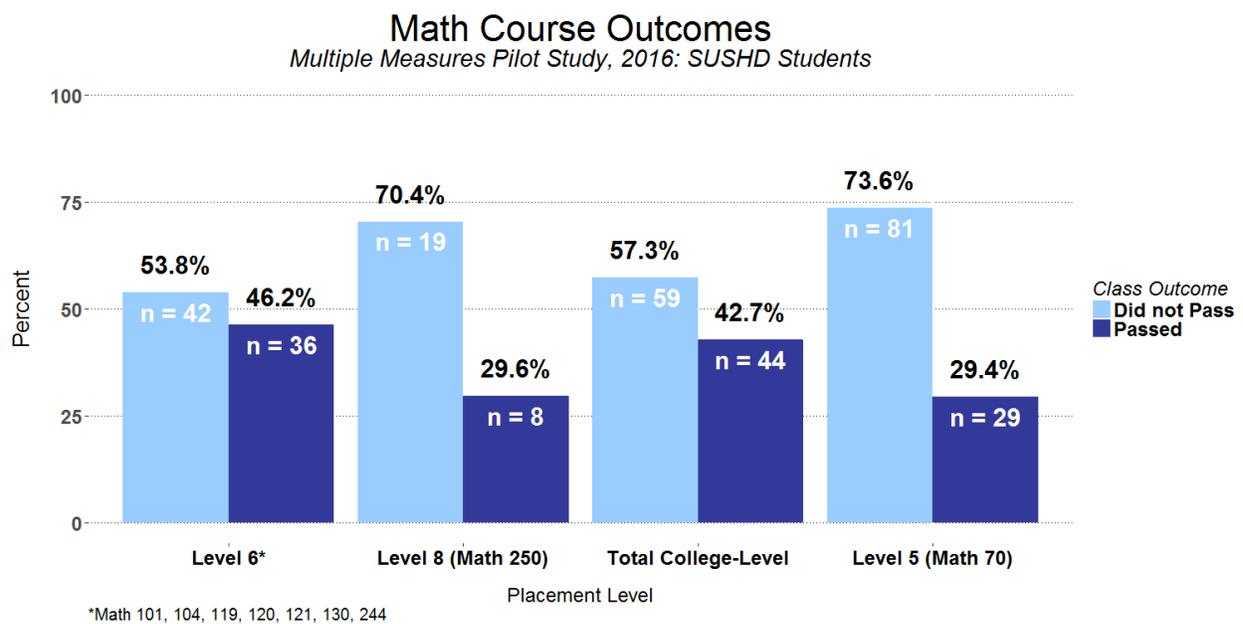

Figure 3: Math Course Outcomes by level of placement. From all college-level courses, students achieved a 42.7% pass rate. For Math 70, the pass rate was 29.4%.

Math Course Outcomes
2016 MM Pilot Study, SUHSD Students

	Level 6*	Math 250	College-Level Total**	Math 70
Did not Pass	42	19	59	81
Passed	36	8	44	29
Total	*78*	*27*	*103*	*110*

* Includes Math 101, 104, 119, 120, 121, 130, and 244

* *Two students took courses in Level 6 and Level 8 (Math 250).

Table 4: Math course outcomes for students placed at Level 5 (Math 70), Level 6*, and Level 8 (Math 250).

MATH COURSE PREDICTION

Due to the small sample size, only four variables were used for college-level Math course prediction: HS GPA, whether the students passed a 12th grade Math class, whether the student took a math course in all four semesters of their junior and senior year of high school, and Elementary Algebra Test Scores. We find that HS GPA is the only significant predictor of college-level Math course performance in this model. For every one-unit increase in HS GPA (e.g. 2.0 vs. 3.0), the odds of success in a college-level math course are approximately 6 times greater (p = .002). However, graphical evidence did not provide a clear cut-point for GPA placement guidelines.

CONCLUSIONS

Research cautions interpretation and use of these results due to small sample sizes. While these results do provide some preliminary information on which factors may be important predictors of student success, more data is needed to more precisely understand what measures can be used to accurately place students in the appropriate course levels. Therefore, a replication of the 2016 MM pilot study with a greater number of students is recommended.