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An empirical analysis of the effects of Mexican American Studies participation on student achievement within Tucson Unified School District

An Empirical Analysis of the Effects of Mexican American Studies Participation on Student Achievement within Tucson Unified School District

Report Submitted
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Willis D. Hawley, Ph.D.,
Special Master for the
Tucson Unified School District
Desegregation Case

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Introduction

At the request of the Special Master, Dr. Willis D. Hawley, these analyses were conducted to examine the relationship between participating in the Tucson Unified School District's (TUSD) Mexican American Studies (MAS) program and student achievement (positively, negatively, or no relationship). While the MAS program has been known by other names (e.g., *Raza* Studies), for the sake of continuity, the program will be referred to as MAS throughout the duration of this report. There are two central questions guiding these analyses:

- What are the relationships between taking MAS courses and educational performance?
- Are these relationships consistent for different cohorts of students over the years?

Previous discussions with the Special Master included proposed analyses regarding MAS participation and its relationship to absenteeism as well as using the number of MAS courses students completed instead of a dichotomous variable of reenrolling or not in MAS. While these are important questions, not all analyses could be conducted due to time constraints. Thus, this report focuses on the areas under the most scrutiny in the current debate surrounding MAS: AIMS test passing, graduating from high school, and students' reported intentions for going to college. The multivariate analytical strategy employed in these analyses allowed us to control for student demographic characteristics (e.g., gender, socioeconomic status (SES), or racial/ethnic background) as well as high school services received (e.g., special education), to explore the relationship between MAS participation and student academic performance. The methodological approach is described below.

Method

Sampling Strategy

To conduct these analyses, the research team worked with administrators within TUSD to develop a database that tracked individual, de-identified students, and their academic performance. Collectively, the research team and TUSD administrators decided to conduct the analyses on the Arizona Department of Education (ADE) defined graduating cohorts for the 2008, 2009, 2010, and 2011 years. While this does not capture the total length of time that the MAS program has been in existence, these four years were chosen for two reasons. First, they represent the cohorts where participation in the MAS program peaked, and therefore, the most robust analytical possibilities existed within these cohorts of students. Second, they had the most complete student data, especially regarding student socioeconomic status (see Appendix A for measures).

TUSD provided the research team the student records for all students within each of the four cohorts (N=26,022). Of this population, 1,587 completed at least one class in the MAS program. Earlier analyses of the MAS program usually compared MAS participants to the rest of TUSD students within a specific cohort (e.g., Department of Accountability and Research, 2011, January 6a and b; Franciosi, 2009). While these analyses offered important insights, there are limitations to this sampling strategy. First, many students were included in the analyses who never had the opportunity to participate in MAS because it was not offered at their respective schools. In addition, previous analyses have indicated that MAS classes tend to enroll a higher proportion of district-defined low and very-low income students as well as racial minorities;

especially Latina/o[1] students.

To address the concerns raised about the comparison samples in earlier studies, the analyses described in this report assessed the impact of MAS participation on demographically-similar students within the same schools. This allows for a more "apples-to-apples" comparison by controlling for the impact that the demographic characteristics described above (gender, socioeconomic status, and race/ethnicity) have on the outcomes studied. Within the district-defined student records, there are five mutually-exclusive racial/ethnic categories, five socioeconomic categories, and two levels of the gender variable (male, female) that students can fall within. Students who completed at least one MAS course were first separated into their respective cohort (2008, 2009, 2010, or 2011), and then into a specific designation based upon the intersection of race/ethnicity by socioeconomic status by gender (see Table 1).

Table 1. Demographic characteristics for creating a comparison sample

		White/ Anglo	African American	Latina/o	Native American	Asian American
Male	Very High Income	-	-	-	-	-
	High Income	-	-	-	-	-
	Medium Income	-	-	-	-	-
	Low Income	-	-	-	-	-
	Very Low Income	-	-	-	-	-
Female	Very High Income	-	-	-	-	-
	High Income	-	-	-	-	-
	Medium Income	-	-	-	-	-
	Low Income	-	-	-	-	-
	Very Low Income	-	-	-	-	-

Within each of the 50 cells of this matrix, an equal number of non-MAS students who were members of the 4-year cohort were randomly selected to create a demographically similar comparison group. For a small number of cells, the number of MAS students was so small that students might be able to be identified, and these students were removed from the analysis to protect their anonymity (n=2). In addition, for students who had missing demographic data (usually the income level) were also removed from the analysis (2008, n=16; 2009, n=0; 2010, n=0; 2011, n=19). Before the sampling was conducted, students who attended schools where MAS courses were not offered were eliminated from consideration as were students who had no enrollment records for their junior or senior year because these were the only two years MAS courses were offered. The final sample for each cohort contained an equal number of MAS and non-MAS students, and along most demographic characteristics, there were no substantial differences (see Appendix B).

[1] There are a number of ways to describe students of Latin American decent (e.g., Hispanic, Mexican American, Chicano, Latina/o), but they will be referred to as Latina/o throughout this report.

Even though the sampling strategy was not designed to draw equal proportions of English Language Learners (ELLs) or Gifted and Talented Education (GATE) students, there were no substantial differences between MAS and non-MAS students in these areas. There was a substantially higher proportion of non-MAS students who were classified as Special Education which is the result of two phenomena. First, a higher proportion of Latina/o students relative to White students in TUSD are classified as Special Education. Second, a low proportion of MAS students are Special Education, but a very high proportion of students are Latina/o. While these differences existed across all four cohorts, this was controlled for in the analyses by entering the classification 'Special Education' as a covariate in each model.

Analyses
The full sample of students (MAS and the comparison, non-MAS) was used to test the following hypotheses using a series of logistic regressions:

- H_0: Participation in MAS classes has *no* impact on student academic success.
- H_1: Participation in MAS classes has a significant, *positive* impact on student academic success.
- H_2: Participation in MAS classes has a significant, *negative* impact on student academic success.

For the purposes of this report, we defined academic success as passing the AIMS test after initial failure and graduating from high school. While there were measures of college attendance in the data set, they tended to be either incomplete or unreliable depending upon the source. The results of college-going analyses are presented, but the findings should be taken with caution for reasons described later. The following specified the regression models following the guidance of Long (1997) to test the relationship between MAS participation and academic success:

$$\frac{\ln(P(\mathrm{Y}))}{(1-P(\mathrm{Y}))} = \beta_0+\beta_1\mathrm{X}_1+\beta_2\mathrm{X}_2+\beta_3\mathrm{X}_3+\beta_4\mathrm{X}_4+\beta_5\mathrm{X}_5+\beta_6\mathrm{X}_6+\beta_7\mathrm{X}_7+\beta_8\mathrm{X}_8+\beta_9\mathrm{X}_9+\beta_{10}\mathrm{X}_{10}+\beta_{11}\mathrm{X}_{11}+\beta_{12}\mathrm{X}_{12}$$

Where,

$\ln(P(\mathrm{Y}))/(1-P(\mathrm{Y}))$=Likelihood of passing AIMS/Graduating/Attending College
β_0=Intercept
β_1 β_2 β_3... β_{11}=regression coefficients
X_1=Student gender
X_2=Student ethnicity, African American (referent White)
X_3=Student ethnicity, Latina/o (referent White)
X_4=Student ethnicity, Native American (referent White)
X_5=Student relative income group, *very low* (referent *medium*)
X_6=Student relative income group, *low* (referent *medium*)
X_7=Student relative income group, *high* (referent *medium*)
X_8=Student relative income group, *very high* (referent *medium*)
X_9=ELL
X_{10}=GATE
X_{11}=Special Ed.
X_{12}=Completed one semester of MAS

Each model differed somewhat regarding the sample that was used. All students within the sample were used to model high school graduation. For the analyses of AIMS passing, students were removed from the sample if they passed the AIMS on their first attempt. We used this more restricted sample of AIMS data because MAS was offered to juniors and seniors, after the first required administration of the AIMS during the sophomore year. If a student passed the AIMS test prior to taking MAS, there is no logical way to link passing rates on the AIMS to MAS enrollment. Consequently, the results of our AIMS analyses are conservative with respect to the potential affect of MAS on AIMS performance, because we are analyzing only data from students who early in their high school attendance did not pass AIMS. Given their evident academic challenges, one would predict more difficulty in passing the AIMS at a later date. For intention to attend college, all students were used in the sample. When students reported that they were intending to go to a 2-year college after graduation, the models included these students and *only* those who did not intend to attend college (e.g., working or military service) and completed the TUSD senior survey. Students who intended to attend a 4-year college/university were removed from the sample for that analysis. When students reported that they were going to attend a 4-year college/university after graduation, the models included these students and *only* the remaining students who did not intend to attend college (e.g., working or military service) and completed the TUSD senior survey. Students who intended to attend a 2-year college were removed from the sample.

Results

The results of these analyses are presented in the temporal order in which they are assumed to have occurred: AIMS test results, graduation, and college going. During the creation of the initial regression models, all independent variables were used via the "Enter" method of variable selection. However, the following variables did not have sufficient variation to be included as covariates, and were subsequently removed from the models: Native American, Asian American, and Very High Income. In addition, in some analyses, African American and High Income were also removed as covariates. This does not mean, for example, that African Americans were removed from the sample, but rather, the dichotomous variable African American (1=Yes; 0=No) was not used as a covariate in the logistic regression model. As the purpose of this report is to analyze the relationship between MAS participation and student academic achievement, only the coefficients for MAS participation are presented in the tables below. The coefficients for the full models are presented in Appendices C-K. Also, regression results are presented as odds ratios instead of B-coefficients due to the ease in interpretation. The odds ratios are centered around 1.00. That is, a result of 1.00 means that MAS and non-MAS students are equally likely to experience the outcome of interest (e.g., high school graduation). Results above 1.00 mean that MAS students are more likely to experience a specific outcome (e.g., an odds ratio of 1.50 for graduating means MAS students are 50 percent *more* likely to graduate than non-MAS students). Results below 1.00 means that MAS students are less likely to experience the outcome (e.g., an odds ratio of 0.50 for graduation means MAS students are 50 percent *less* likely to graduate than non-MAS students). Using conventionally accepted standards for interpreting the probability of statistical findings arising from chance alone, the p-value of 0.05 was used as the cut point to determine odds-ratio significance.

AIMS Passing

The first model examined the relationship between passing all AIMS tests and participation in MAS. The subsequent models analyzed this relationship for individual AIMS tests (i.e., Math, Reading, and Writing). After removing those students who passed all AIMS tests on their first attempt, four different models (one for each cohort) were constructed to determine the relationship between MAS participation and subsequently passing all three AIMS tests. For three of the four cohorts (2008, 2010, and 2011), MAS students who failed at least one AIMS test initially were significantly more likely to ultimately pass all three AIMS tests (see Table 2). MAS students in the 2010 cohort were 64 percent more likely to pass their AIMS tests, and MAS students in the 2008 cohort were 118 percent more likely to pass.

Table 2. Odds ratios, MAS Participation and AIMS passing

	2008		2009		2010		2011	
AIMS Test	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
All	2.184	0.000	1.516	0.064	1.639	0.023	1.816	0.005
Writing	2.622	0.001	1.344	0.320	1.658	0.103	1.679	0.072
Reading	2.675	0.002	1.725	0.052	1.215	0.501	2.011	0.022
Math	2.441	0.001	1.955	0.010	1.563	0.077	1.221	0.423

Note: For full regression results including sample sizes for all analyses, see Appendices C-F.

A similar method was used to analyze the relationship between MAS participation and individual AIMS tests (Writing, Reading, and Math). Those who passed the individual test on their first attempt were removed from the sample, and logistic regression models were created for the remaining students. For the AIMS Writing test, the results were somewhat different relative to the model of students passing all AIMS tests. One of the four models returned significant, positive results for MAS participation (2008). The MAS students in this sample were 162 percent more likely to pass than students who did not take MAS courses. The other three models did not yield significant results.

The AIMS Reading model produced similar, but somewhat weaker results relative to passing all three tests. There was a significant, positive relationship between MAS participation and passing the AIMS Reading test for two of the four cohorts (2008 and 2011). Students in the 2009 cohort just missed the significance cut off as the p-value was 0.052. For the 2011 cohort, MAS students were 101 percent more likely to pass their AIMS Reading test, and 2008 MAS students were 168 percent more likely to pass than were non-MAS students.

Finally, there was a positive relationship between MAS participation and passing the AIMS Math test. In the 2008 and 2009 cohorts, MAS students were 144 percent and 96 percent more likely to pass the AIMS Math than non-MAS students. While the relationship between MAS participation and passing the AIMS Math test was positive for the 2010 and 2011 cohorts, the p-values did not meet the 0.05 threshold for significance.

Graduation

There are two measures of graduation within the data and logistic regression models were created for both outcomes. The first was the ADE-designated cohort graduation. The second was a measure of whether a student graduated at all, including outside of his/her cohort (e.g., taking an additional year of high school). The ADE cohort graduation measure is more restrictive, but MAS participation tended to have a significant, positive impact on both graduation measures. For the ADE cohort graduation rate, MAS participation was a significant, positive predictor for three of the four cohorts (2008, 2009, and 2010; see Table 3). Students who took MAS courses were between 51 percent more likely to graduate from high school than non-MAS students (2009) and 108 percent more likely to graduate (2008).

Table 3. Odds ratios, MAS participation and graduation

	2008		2009		2010		2011	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Graduation (ADE cohort)	2.080	0.001	1.513	0.041	1.595	0.023	1.211	0.290
Graduation (anywhere)	2.495	0.002	2.230	0.002	2.029	0.004	1.457	0.056

Note: For full regression results including sample sizes for all analyses, see Appendices G-H.

The results were even more pronounced for models where the dependent variable was graduation at any time. MAS participation was a significant, positive predictor of graduation for three of the four cohorts, and ranged from MAS students being 46 percent more likely to graduate (2011) to 150 percent more likely than non-MAS students to graduate (2008). MAS students in 2011 were 46 percent more likely to graduate from high school, but the model just missed the significance cut off being p=0.056.

Intention to Attend College

College-going was a key component of this analysis, but the modeling was not as successful as the previous two sections because the available data were not as complete or accurate as AIMS passing and Graduation data. Ideally, the analysis would involve using the National Clearinghouse data that accurately tracks where students attend college. Unfortunately, the primary college destination for TUSD graduates, Pima Community College, does not subscribe to the Clearinghouse. Thus, reliable Clearinghouse data in the sample are available for only 17 percent of students in the 2008 cohort; 14 percent in 2009; 15 percent in 2010; and less than 1 percent in 2011.

Instead, more complete data are available in the Senior Survey administered by TUSD where students are asked to report their post-graduation intentions. The data in this survey posed analytical problems as well. First, the data were not as complete as measures of AIMS passing. For the 2008 sample, 79 percent of students completed the survey; 82 percent in 2009; 84 percent in 2010; and 78 percent in 2011. Second, it is impossible to determine how accurate these self-reported data are as the primary destination of students, Pima Community College, cannot be cross-referenced with the Clearinghouse data.

As college-going was part of the overall analytical strategy, the regression models were run to assess the relationship between MAS participation and intention to enroll in a 2- or 4-year institution of higher education post-graduation; however, these results need to be interpreted with caution because a student's state intent to enroll does not always translate into actual behavior.

The results were mixed without clear trends emerging. The models showed no significant relationship between taking MAS classes and intention to attend college (positive or negative) for 2008. The relationships were negative for 2009 and Attending a 4-Year College/University in 2009, 2011.

Table 4. Odds ratios, MAS participation and intention to attend a college

	2008		2009		2010		2011	
Intention	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Attend College/University	0.861	0.431	0.544	0.001	0.947	0.788	0.807	0.325
Attend a 2-Year College	0.928	0.706	0.554	0.002	1.067	0.759	0.933	0.760
Attend a 4-Year College/University	0.667	0.132	0.462	0.008	0.549	0.041	0.528	0.027

Note: For full regression results including sample sizes for all analyses, see Appendices I-K.

In addition to the issues with the data, this is a function of the analytical strategy employed. The only students considered in these models were those who completed the Senior Survey. Students who dropped out of school were substantially less likely to complete the survey, and non-MAS students had a higher dropout rate than MAS students. Thus, the lowest performing students were not considered in the models, thereby, skewing the results.

Discussion

Returning to the three hypotheses that drove these analyses, no empirical evidence indicated that MAS participation adversely affected student achievement. Moreover, there is sufficient empirical evidence in analyses of two of the three outcomes (AIMS passing and graduation) to reject the null hypothesis (i.e., there is no significant relationship). Of the 12 regression models predicting AIMS passing, MAS participation was positively related to the dependent variable in every case and seven of these relationships were significant. A similar trend existed for graduation rates. MAS participation was positively related to graduating in all eight regression models, and this relationship was significant in six of them. These results suggest that there is a consistent, significant, positive relationship between MAS participation and student academic performance.

Future analyses should address the following issues that the current report could not include:

- What is it about the classes that make them effective?
- Is there a threshold in terms of the number of classes taken where the largest effects are seen?
- What is the relationship between MAS participation and rates of absenteeism?

In addition, when more accurate data become available to model college-going as a function of MAS participation, this would also be an important analysis to conduct.

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Appendix A. Description and measures for variables used in regression analyses

Dependent Variables	
Graduate	Student graduated from high school at any point (1=Yes; 0=No)
Cohort graduate	Student is a graduate from an ADE cohort (1=Yes, 0=No)
AIMS Writing	Student passed the high school AIMS Writing test after initially failing (1=Yes; 0=No)
AIMS Reading	Student passed the high school AIMS Reading test after initially failing (1=Yes; 0=No)
AIMS Math	Student passed the high school AIMS Math test after initially failing (1=Yes; 0=No)
AIMS, All Subjects	Student passed all the high school AIMS Writing test after initially failing at least one (1=Yes; 0=No)
2-Year College	Student intends to enroll in a 2-year college after graduating from high school (1=Yes; 0=No)
4-Year College	Student intends to enroll in a 4-year college after graduating from high school (1=Yes; 0=No)
Any College/University	Student intends to enroll in a college or university after graduating from high school (1=Yes; 0=No)
Independent Variables	
Gender	1=Male; 2=Female
African American	1=Yes; 0=No
Latina/o	1=Yes; 0=No
White	1=Yes; 0=No
Native American	1=Yes; 0=No
Asian American	1=Yes; 0=No
Very High Income	Student did *not* participate in the Federal Meals program and lives in a Census Block where the median income is greater than or equal to $68,000 (1=Yes; 0=No)
High Income	Student did *not* participate in the Federal Meals program and lives in a Census Block where the median income between $38,000 and $67,999 (1=Yes; 0=No)
Middle Income	Student did *not* participate in the Federal Meals program and lives in a Census Block where the median income is less than or equal to $38,000, or Student participated in the Federal Meals program and lives in a Census Block where the median income is greater than or equal to $38,000 (1=Yes; 0=No)
Low Income	Student participated in the Federal Meals program and lives in a Census Block where the median income is between $23,000 and $37,999 (1=Yes; 0=No)
Very Low Income	Student participated in the Federal Meals program and lives in a Census Block where the median income is less than $22,999 (1=Yes; 0=No)
English Language Learner (ELL)	Student was at some point classified as ELL in high school (1=Yes; 0=No)
Gifted and Talented Education (GATE)	Student was at some point classified as GATE in high school (1=Yes; 0=No)
Special Education (Special Ed.)	Student was at some point classified as Special Ed. in high school (1=Yes; 0=No)
Mexican American Studies (MAS)	Student completed at least one semester credit of MAS (1=Yes; 0=No)

Appendix B. Descriptive statistics by cohort group

	2008 (n=822)		2009 (n=742)		2010 (n=736)		2011 (n=800)	
	MAS% (n=411)	Non-MAS% (n=411)	MAS% (n=371)	Non-MAS% (n=371)	MAS% (n=368)	Non-MAS% (n=368)	MAS% (n=400)	Non-MAS% (n=400)
Race/Ethnicity								
White	6.3	6.3	5.7	5.7	7.9	7.9	8.5	8.5
African American	2.7	2.7	3.2	3.2	4.6	4.6	2.5	2.5
Latina/o	87.1	87.1	85.2	85.2	84.0	84.0	85.3	85.3
Native American	3.6	3.6	4.9	4.9	3.5	3.5	2.5	2.5
Asian American	0.2	0.2	1.1	1.1	0.0	0.0	1.3	1.3
Socioeconomic Status								
Very High Income	0.5	0.5	1.1	1.1	2.2	2.2	0.8	0.8
High Income	17.0	17.0	11.6	11.6	10.6	10.6	6.8	6.8
Middle Income	30.7	30.7	31.3	31.3	31.5	31.5	28.8	28.8
Low Income	36.3	36.3	42.0	42.0	40.5	40.5	50.3	50.3
Very Low Income	15.6	15.6	14.0	14.0	15.2	15.2	13.5	13.5
Gender								
Female	56.7	56.7	52.6	52.6	57.9	57.9	53.5	53.5
Male	43.3	43.3	47.4	47.4	42.1	42.1	46.5	46.5
English Language Learner	21.9	13.9	14.6	11.3	10.6	8.4	12.8	10.0
GATE	21.9	21.4	20.5	19.9	17.9	17.9	25.5	23.5
Special Education	10.2	15.6	10.2	21.3	11.4	18.8	9.5	20.8
Graduate (ADE cohort)	90.5	81.8	84.4	78.4	86.1	79.6	78.3	75.0
Graduated from High School Anywhere	95.4	89.3	93.0	86.3	91.8	85.3	84.3	78.8
Dropout	1.2	4.9	2.4	3.0	3.0	7.3	5.0	11.3

Note: The 1,550 non-MAS students used in the sample derived from a larger sample of 13,054 non-MAS students in ADE-defined cohorts.

Appendix C. Regression Results, AIMS Passing All Subjects

	2008		2009		2010		2011	
	n=505		n=412		n=427		n=414	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	0.949	0.806	1.601	0.039	0.989	0.961	0.874	0.531
Race/Ethnicity								
African American (referent, White)	0.285	0.056	0.996	0.996	0.103	0.001	-	-
Latina/o (referent, White)	1.058	0.883	1.200	0.635	0.501	0.088	1.026	0.942
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	2.623	0.016	1.337	0.551	1.639	0.332	2.786	0.070
Low Income (referent, Middle Income)	0.831	0.480	0.553	0.025	0.678	0.136	0.944	0.820
Very Low Income (referent, Middle Income)	0.716	0.272	0.866	0.679	0.723	0.329	0.548	0.085
High School Designations/Services								
English Language Learner	1.186	0.508	0.677	0.138	0.751	0.339	0.597	0.056
GATE	3.554	0.004	1.877	0.155	2.556	0.060	1.919	0.089
Special Education	0.182	0.000	0.160	0.000	0.163	0.000	0.251	0.000
Mexican American Studies	2.184	0.000	1.516	0.064	1.639	0.023	1.816	0.005
Nagelkerke R Square	0.229		0.230		0.218		0.178	

Note: Variables not included in the models due to small Ns: Native American (all years), Asian American (all years), Very High Income (all years), and African American (2011 only); 2008 (MAS n=266; non-MAS n=239), 2009 (MAS n=207; non-MAS n=205), 2010 (MAS n=220; non-MAS n=207), 2011 (MAS n=203; non-MAS n=211)

Appendix D. Regression Results, AIMS Writing Passing

	2008		2009		2010		2011	
	n=342		n=246		n=288		n=266	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	1.148	0.623	2.334	0.006	1.665	0.100	1.158	0.618
Race/Ethnicity								
African American (referent, White)	0.467	0.336	0.112	0.087	0.043	0.000	0.114	0.083
Latina/o (referent, White)	1.217	0.711	0.452	0.147	0.545	0.288	0.150	0.017
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	8.210	0.008	0.604	0.492	-	-	0.983	0.985
Low Income (referent, Middle Income)	1.235	0.529	1.011	0.977	0.354	0.006	0.887	0.740
Very Low Income (referent, Middle Income)	0.956	0.906	1.383	0.481	0.409	0.052	0.374	0.044
High School Designations/Services								
English Language Learner	2.167	0.029	1.887	0.061	0.560	0.136	0.547	0.073
GATE	5.473	0.029	2.998	0.140	2.095	0.365	1.661	0.395
Special Education	0.450	0.011	0.323	0.000	0.236	0.000	0.223	0.000
Mexican American Studies	2.622	0.001	1.344	0.320	1.658	0.103	1.679	0.072
Nagelkerke R Square	0.203		0.206		0.234		0.217	

Note: Variables not included in the models due to small Ns: Native American, Asian American, Very High Income, and High Income (only in 2010); 2008 (MAS n=181; non-MAS n=161), 2009 (MAS n=118; non-MAS n=128), 2010 (MAS n=134; non-MAS n=154), 2011 (MAS n=133; non-MAS n=133)

Appendix E. Regression Results, AIMS Reading Passing

	2008		2009		2010		2011	
	n=314		n=279		n=263		n=261	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	1.130	0.683	1.311	0.336	1.153	0.626	0.998	0.995
Race/Ethnicity								
African American (referent, White)	0.223	0.063	1.020	0.982	0.129	0.012	0.209	0.144
Latina/o (referent, White)	1.146	0.797	0.646	0.380	0.986	0.979	0.376	0.160
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	1.672	0.387	3.034	0.139	1.325	0.681	-	-
Low Income (referent, Middle Income)	0.611	0.194	0.784	0.489	0.698	0.314	0.723	0.364
Very Low Income (referent, Middle Income)	0.400	0.030	1.079	0.878	0.603	0.238	0.331	0.017
High School Designations/Services								
English Language Learner	1.796	0.125	1.322	0.399	1.626	0.217	1.158	0.683
GATE	3.171	0.096	0.739	0.587	2.157	0.359	4.671	0.144
Special Education	0.126	0.000	0.273	0.000	0.268	0.000	0.218	0.000
Mexican American Studies	2.675	0.002	1.725	0.052	1.215	0.501	2.011	0.022
Nagelkerke R Square	0.339		0.156		0.177		0.236	

Note: Variables not included in the models due to small Ns: Native American, Asian American, Very High Income, and High Income (2011 only); 2008 (MAS n=153; non-MAS n=161), 2009 (MAS n=139; non-MAS n=140), 2010 (MAS n=138; non-MAS n=125), 2011 (MAS n=123; non-MAS n=138)

Appendix F. Regression Results, AIMS Math Passing

	2008		2009		2010		2011	
	n=351		n=331		n=306		n=315	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	0.945	0.826	1.422	0.185	0.973	0.918	1.246	0.383
Race/Ethnicity								
African American (referent, White)	0.421	0.222	0.751	0.712	0.138	0.014	-	-
Latina/o (referent, White)	1.148	0.767	1.295	0.544	0.745	0.524	1.402	0.414
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	1.992	0.125	1.148	0.805	1.750	0.343	4.051	0.028
Low Income (referent, Middle Income)	0.737	0.353	0.555	0.067	0.899	0.718	0.719	0.261
Very Low Income (referent, Middle Income)	0.811	0.572	0.979	0.959	0.419	0.027	0.515	0.103
High School Designations/Services								
English Language Learner	1.132	0.710	0.764	0.406	1.026	0.940	1.110	0.737
GATE	3.054	0.031	1.898	0.241	1.774	0.322	1.854	0.198
Special Education	0.150	0.000	0.149	0.000	0.187	0.000	0.277	0.423
Mexican American Studies	2.441	0.001	1.955	0.010	1.563	0.077	1.221	0.423
Nagelkerke R Square	0.259		0.270		0.211		0.164	

Note: Variables not included in the models due to small Ns: Native American (all years), Asian American (all years), Very High Income (all years), and African American (2011 only); 2008 (MAS n=179; non-MAS n=172), 2009 (MAS n=159; non-MAS n=172), 2010 (MAS n=157; non-MAS n=149), 2011 (MAS n=138; non-MAS n=177)

Appendix G. Regression Results, Graduation (anywhere)

	2008		2009		2010		2011	
	n=822		n=742		n=736		n=800	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	2.111	0.007	3.138	0.001	1.983	0.005	1.923	0.001
Race/Ethnicity								
African American (referent, White)	0.158	0.028	1.269	0.781	0.519	0.242	0.393	0.153
Latina/o (referent, White)	0.462	0.213	0.972	0.947	1.298	0.506	0.911	0.786
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	2.133	0.148	1.400	0.491	2.125	0.181	1.798	0.300
Low Income (referent, Middle Income)	0.879	0.694	0.732	0.284	0.934	0.806	0.761	0.246
Very Low Income (referent, Middle Income)	0.711	0.384	0.929	0.859	0.611	0.148	0.508	0.024
High School Designations/Services								
English Language Learner	0.854	0.650	0.797	0.514	1.266	0.566	0.454	0.002
GATE	1.742	0.162	1.385	0.356	3.125	0.010	4.577	0.000
Special Education	0.699	0.299	1.095	0.783	1.700	0.138	0.958	0.876
Mexican American Studies	2.495	0.002	2.230	0.002	2.029	0.004	1.457	0.056
Nagelkerke R Square	0.095		0.094		0.089		0.148	

Note: Variables not included in the models due to small Ns: Native American, Asian American, and Very High Income

Appendix H. Regression Results, Graduation (ADE Cohort)

	2008		2009		2010		2011	
	n=822		n=742		n=736		n=800	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	1.966	0.001	3.007	0.000	2.190	0.000	2.191	0.000
Race/Ethnicity								
African American (referent, White)	0.553	0.343	4.931	0.047	0.766	0.611	0.423	0.156
Latina/o (referent, White)	1.187	0.621	1.838	0.042	1.312	0.411	0.971	0.923
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	1.456	0.291	1.825	0.136	2.491	0.070	1.469	0.398
Low Income (referent, Middle Income)	0.603	0.046	0.737	0.184	0.785	0.302	0.864	0.492
Very Low Income (referent, Middle Income)	0.988	0.972	1.182	0.619	0.640	0.139	0.601	0.069
High School Designations/Services								
English Language Learner	1.283	0.395	0.757	0.315	0.935	0.837	0.475	0.002
GATE	1.964	0.024	2.442	0.005	3.428	0.001	5.021	0.000
Special Education	0.673	0.148	0.815	0.419	0.812	0.428	1.067	0.787
Mexican American Studies	2.080	0.001	1.513	0.041	1.595	0.023	1.211	0.290
Nagelkerke R Square:	0.091		0.131		0.105		0.159	

Note: Variables not included in the models due to small Ns: Native American, Asian American, and Very High Income

Appendix I. Regression Results, Intention to Attend Any College/University

	2008		2009		2010		2011	
	n=645		n=611		n=620		n=622	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	1.207	0.327	1.476	0.033	1.944	0.001	1.723	0.012
Race/Ethnicity								
African American (referent, White)	1.189	0.837	1.899	0.254	1.367	0.625	2.941	0.323
Latina/o (referent, White)	0.856	0.641	1.499	0.138	1.166	0.641	1.146	0.681
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	1.969	0.027	1.035	0.910	2.497	0.038	1.657	0.335
Low Income (referent, Middle Income)	0.889	0.598	0.916	0.681	0.976	0.913	0.841	0.483
Very Low Income (referent, Middle Income)	1.771	0.080	1.675	0.098	1.347	0.368	0.801	0.544
High School Designations/Services								
English Language Learner	0.821	0.421	0.377	0.000	1.165	0.650	1.689	0.196
GATE	1.343	0.207	1.913	0.007	4.102	0.000	1.763	0.033
Special Education	0.641	0.099	0.572	0.025	0.831	0.496	0.809	0.473
Mexican American Studies	0.861	0.431	0.544	0.001	0.947	0.788	0.807	0.325
Nagelkerke R Square	0.045		0.111		0.099		0.052	

Note1: Variables not included in the models due to small Ns: Native American, Asian American, Very High Income; 2008 (MAS n=340; non-MAS n=305), 2009 (MAS n=317; non-MAS n=294), 2010 (MAS n=324; non-MAS n=296), 2011 (MAS n=324; non-MAS n=298)

Note 2: Only those who completed the Senior Survey were part of the model.

Appendix J. Regression Results, 4 Year College Anticipated Attendance

	2008		2009		2010		2011	
	n=274		n=301		n=269		n=267	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	1.668	0.071	3.201	0.000	2.233	0.008	1.719	0.050
Race/Ethnicity								
African American (referent, White)	0.709	0.757	1.623	0.572	0.578	0.530	1.570	0.728
Latina/o (referent, White)	0.575	0.198	1.127	0.766	0.856	0.734	0.686	0.344
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	1.877	0.104	0.831	0.682	2.168	0.154	1.420	0.575
Low Income (referent, Middle Income)	0.682	0.239	0.421	0.012	0.599	0.117	0.623	0.126
Very Low Income (referent, Middle Income)	1.101	0.848	0.717	0.506	1.011	0.982	0.957	0.923
High School Designations/Services								
English Language Learner	0.524	0.115	0.388	0.078	0.689	0.480	1.191	0.746
GATE	2.716	0.001	4.540	0.000	8.338	0.000	3.426	0.000
Special Education	0.331	0.029	0.273	0.013	0.097	0.001	0.368	0.035
Mexican American Studies	0.667	0.132	0.462	0.008	0.549	0.041	0.528	0.027
Nagelkerke R Square	0.211		0.345		0.353		0.214	

Note 1: Variables not included in the models due to small Ns: Native American, Asian American, Very High Income; 2008 (MAS n=140; non-MAS n=134), 2009 (MAS n=168; non-MAS n=133), 2010 (MAS n=133; non-MAS n=136), 2011 (MAS n=135; non-MAS n=132)

Note 2: Students indicating they intended to attend a two-year institution were removed from this analysis and only those who completed the Senior Survey were part of the model.

Appendix K. Regression Results, 2 Year College Anticipated Attendance

	2008		2009		2010		2011	
	n=523		n=510		n=486		n=466	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Demographic Variables								
Gender (1=Male, 2=Female)	1.101	0.627	1.224	0.290	1.869	0.004	1.774	0.011
Race/Ethnicity								
African American (referent, White)	1.318	0.750	2.225	0.171	1.667	0.438	4.913	0.155
Latina/o (referent, White)	0.977	0.946	1.760	0.057	1.288	0.463	1.731	0.131
Native American (referent, White)	-	-	-	-	-	-	-	-
Asian American (referent, White)	-	-	-	-	-	-	-	-
Socioeconomic Status								
Very High Income (referent, Middle Income)	-	-	-	-	-	-	-	-
High Income (referent, Middle Income)	1.853	0.051	1.161	0.639	2.534	0.041	2.040	0.190
Low Income (referent, Middle Income)	0.934	0.768	1.142	0.556	1.067	0.784	0.999	0.997
Very Low Income (referent, Middle Income)	1.954	0.045	2.113	0.019	1.483	0.249	0.888	0.754
High School Designations/Services								
English Language Learner	0.876	0.600	0.369	0.001	1.483	0.542	1.799	0.154
GATE	1.030	0.906	1.208	0.466	3.028	0.004	1.225	0.465
Special Education	0.731	0.254	0.641	0.083	1.107	0.713	1.048	0.876
Mexican American Studies	0.928	0.706	0.554	0.002	1.067	0.759	0.933	0.760
Nagelkerke R Square	0.032		0.088		0.073		0.046	

Note 1: Variables not included in the models due to small Ns: Native American, Asian American, Very High Income; 2008 (MAS n=284; non-MAS n=239), 2009 (MAS n=271; non-MAS n=239), 2010 (MAS n=263; non-MAS n=223), 2011 (MAS n=251; non-MAS n=215)
Note 2: Students indicating they intended to attend a two-year institution were removed from this analysis and only those who completed the Senior Survey were part of the model.