

Office of Black Male Student Achievement – B.L.A.C.K Course Impact Study *internal draft*

Findings from a propensity score matching study. Fall 2017

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Background and Descriptive Statistics

The Office of Black Male Student Achievement (OBMSA) is an office within Minneapolis Public Schools (MPS) to address the needs to Black male students (also known as Kings). The director, Michael Walker, developed a course – Building Lives Acquiring Cultural Knowledge (B.L.A.C.K.) to teach the Kings about their history and taught from a Black man community expert.

Enrollment in the B.L.A.C.K. Course

The course began in the 2015-16 school year at 4 middle schools and 4 high schools and has continued in the same number of schools during the 2016-17 school year with one switch at the high school level. The sites determined the students who would enroll in the course, but were encouraged to choose a group of students that varied in terms of prior grades, achievement, behavior incidences, and engagement in school. See table 1 for a description of who has enrolled in the B.L.A.C.K. course. See Appendix A for more descriptive statistics about students enrolled in the course during the 2016-17 school year.

Table 1. B.L.A.C.K. Course Enrollment by Site

School	N SY15-16	N SY 16-17*
FIELD	26	21
FOLWELL ARTS	11	16
NORTHEAST	27	34
FRANKLIN	26	32
EDISON	17	25
SOUTH	23	31
NORTH ACAD	28	43
HARRISON SEC	11	-
FAIR SENIOR HIGH	-	16
TOTAL	169	198

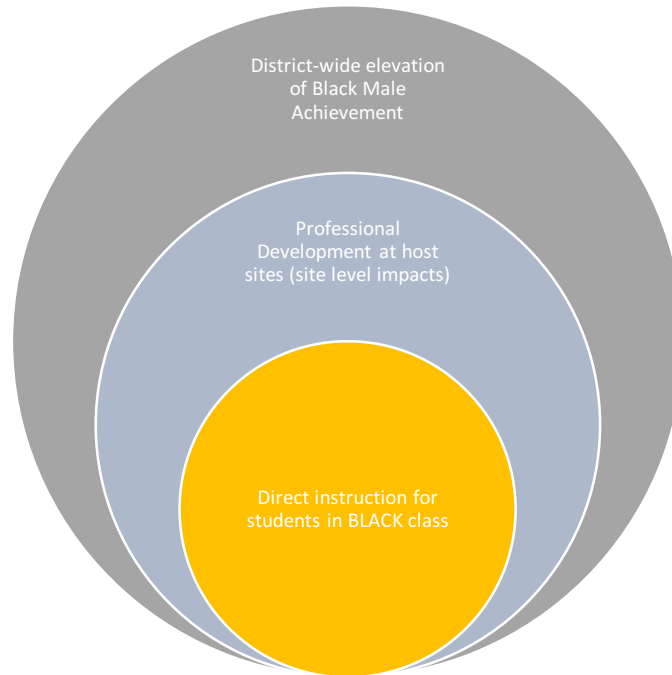
*Enrolled at end of Quarter 4

Descriptive Statistics, GPA and Attendance

OBMSA has multiple spheres of influence across the district. By the creation of the office, the achievement of Black males has been elevated across the district. In addition, sites that host the course

are required to engage in ongoing professional development of their staff. Finally, students in the course have direct instruction through the office. See Figure 1 for a graphic representation of this.

Figure 1. Ecological Framework of OBMSA



At the end of the 2016-17 school year, REAA investigated trends in GPA and attendance for the B.L.A.C.K. student participants over the past two years. Based on the descriptive statistics at the end of the 2015-16 and beginning of the 2016-17 school year, there was an upward trend in quarterly GPA and attendance consistent with this ideas of the spheres of influence. GPA in all three groups.

Figure 2. Black Male Annual GPA averages from School Year 2016 and 2017

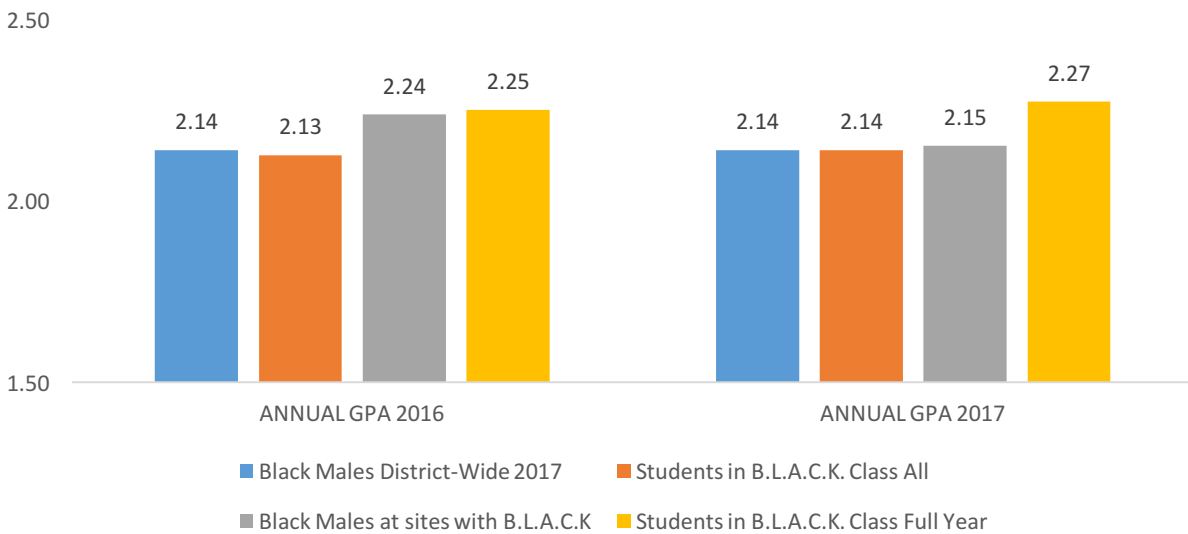
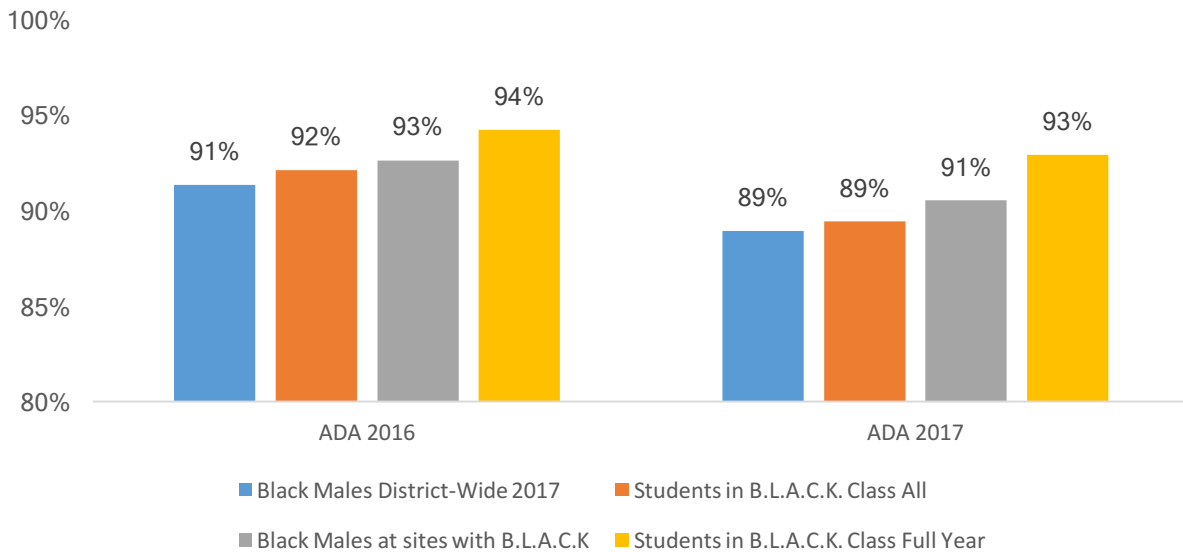


Figure 3. Black Male Average Daily Attendance (ADA) from 2016 to 2017



While these findings are promising, we cannot statistically attribute these trends to the program or course. These promising descriptive findings prompted REAA and OBMSA to design a mixed-methods quasi-experimental study to determine whether this could be attributed to the program.

Propensity Score Matching Study

Propensity score analysis (PSM) is a statistical matching technique that estimates the effect of a treatment when groups have not been experimentally assigned. It matches students who take the B.L.A.C.K. course to students who looked like them on a set of important characteristics before the course, and then follows the matches to present day to determine if statistical differences exist on outcomes of interest.

Research Questions

The purpose of the PSM study is to answer the following questions about participation in the B.L.A.C.K. course through the end of the 2017 school year:

1. What impact, if any, does participation in the 2017 B.L.A.C.K. course have on students' annual GPA in 2017?
2. What impact, if any, does participation in the 2017 B.L.A.C.K. course have on students' average daily attendance?
3. What impact, if any, does participation in the 2017 B.L.A.C.K. course have on high school credit-readiness?
4. What impact, if any, does the number of participation years 2016 and 2017 (e.g. dosage) have on student GPA and attendance? In other words, does the number of years matter or is one year sufficient?

Selecting the PSM Model

The goal of PSM is to reduce potential bias in the analysis by balancing the participants and control group on any baseline variables (such as prior achievement, lunch status, etc.) that might be related to the outcomes of interest (GPA, attendance). Both the selection criteria and program theory guided this process resulting in a PSM model that controlled for grade level, ethnicity (African American only), gender (males only), English Learner status (non-EL only), free/reduced price lunch eligibility, special education service eligibility, mobility status, and cumulative GPA prior to program start.

B.L.A.C.K. Participants

Like most courses with mobile student populations, many B.L.A.C.K. participants have come in and out of the course throughout the two years of the program. To understand program impact it was important to limit the participant study pool to just students who had the opportunity to receive the full program 'dosage' either by having 1) continuous enrollment throughout the 2017 school year or 2) continuous enrollment for the two full years of the program. The pool was further limited to student in grade 8-12 due to the model requirement of a prior baseline GPA in 2015. The following table shows the number participants in the matching set by location and years of continuous participation.

Table 2. Continuous Participants by Site and Years of Continuous Participation Grades 8-12

SCHOOL NAME	1yr Cont. Participant 2017 only	2yr Cont. Participant 2016 and 2017	Total Participant Pool
FIELD COMMUNITY	4	6	10
FOLWELL ARTS MAGNET	0	6	6
NORTHEAST MIDDLE	11	0	11
FRANKLIN MIDDLE	2	1	3
FAIR SENIOR HIGH	4	2	6
EDISON HIGH	7	7	14
SOUTH HIGH	12	3	15
NORTH ACAD	5	7	12
Total	45	32	77

Non-Participant Matching Pool

The non-participant matching pool was established using a quasi-randomized block design to ensure the pool matched selection criteria for participation: African American, non-English Learner (EL) males. The sample also excluded all students enrolled at the B.L.A.C.K. course sites or any students who took the course in the past. Like the participants, matching students also had to have a valid GPA in 2015. Certain specialty sites were excluded from the pool due to conceptual differences or confounding variables. For example, Stadium View was excluded because it is a school for incarcerated youth. The final matching pool included a total of 1105 students across grades 8-12.

Methodology

Using logistic regression, selection criteria for matching used nearest-neighbor with replacement, with a 2 to 1 oversample ratio of non-participants. Once all participants were matched, treatment effects were analyzed using ANOVA, and independent samples t and non-parametric Mann-Whitney U tests.

Results

The propensity score models matched the 77 continuously enrolled B.L.A.C.K. students to 130 control students across 22 sites. Balance improvement was assessed for all grade levels and all sets were retained under the specified model. Table 3 provides the balance matching summary for all covariates.

Table 3. Balance Summary

	Participant		Matched Control		Mean Diff	t	p.
	Mean	N	Mean	n			
Lunch Eligible Status	0.922	77	0.909	130	0.013	0.251	0.802
Spec Ed Status	0.337	77	0.343	130	-0.006	0.082	0.935
Mobility Status	0.116	77	0.103	130	0.013	0.302	0.763
Prior GPA SY2015	2.206	77	2.202	130	0.004	0.061	0.952

Research Question 1: What impact, if any, does participation in the 2017 B.L.A.C.K. course have on students' annual GPA in 2017?

To address this question participants mean annual GPA at the end of school year 2017 was compared for the two groups. Among all African American males in the sample across grades 8-12 ($N = 204$), there was a statistically significant difference between the B.L.A.C.K. course participants ($M = 2.246$, $SD = 0.740$) and the matched sample comparison group ($M = 1.961$, $SD = 0.934$), $t(202) = 2.409$, $p \leq .05$, $CI_{.95}$ 0.052, 0.518.

Research Question 2: What impact, if any, does participation in the 2017 B.L.A.C.K. course have on students' average daily attendance?

Average daily attendance (ADA) for academic year 2017 was calculated for all students by dividing the total number of days present by total membership days that year (average membership days = 169.3). Among all African American males in the sample across grades 8-12 ($N = 207$), there was no statistically significant difference between the B.L.A.C.K. course participants ($M = .913$, $SD = .075$) and the matched sample comparison group ($M = .898$, $SD = .273$), $t(205) = 0.591$, $p \geq .05$, $CI_{.95}$ -0.035, 0.065.

Research Question 3: What impact, if any, does participation in the 2017 B.L.A.C.K. course have on high school credit-readiness?

Credit-readiness is a high school indicator that indicates whether or not a student currently has earned enough credits to be considered on-track to graduate within 4-years. This figure was calculated for all high school students in the study, providing an 'on-track' status for all students at the end of 2017. Among all African American males in the sample ($N = 133$), there was a statistically significant difference between the B.L.A.C.K. course participants ($M = .883$, $SD = .337$) and the matched sample comparison group ($M = .554$, $SD = .468$), $z = -4.993$, $p \leq .001$.

Table 4 provides the group statistics summary for each outcome and table 5 provides a summary of treatment effects for research questions 1-2. Table 6 shows the results for the independent samples chi-square test for credit-readiness.

Table 4. Research Questions 1-3 Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
ANNUAL GPA SY17	PARTIC	77	2.246	0.740	0.084
	CONTROL	127	1.961	0.934	0.083
PCT ATTEND SY17	PARTIC	77	0.913	0.075	0.009
	CONTROL	130	0.898	0.273	0.024
CREDIT READY (HS ONLY)	PARTIC	47	0.872	0.337	0.049
	CONTROL	86	0.714	0.468	0.050

Table 5. Independent samples t-test for GPA and Average Daily Attendance

	Mean Difference	Sd Diff	95% CI		t	df	Sig. (2-tailed)	r Effect Size	Cohen's D
			Lower	Upper					
GPA SY17	0.285	0.125	0.052	0.518	2.409	202	0.017*	0.169	0.344
ADA SY17	0.015	0.025	-0.035	0.065	0.591	205	0.555	0.058	0.118

*Significant at $p < .05$

Research Question 4: 1. What impact, if any, does the number of participation years (e.g. dosage) have on student GPA? In other words, does the number of years matter or is one year sufficient? Academic year 2017 marked the end of two years of B.L.A.C.K. program implementation. For this reason it was also of interest to learn if the number of years or ‘dosage’ had an impact on the outcomes of interest. To estimate this effect, students in the study sample were divided into control, one year of continuous participation during 2017, and two full years of continuous participation in both 2016 and 2017. Between subjects analysis of variance showed that there was a significant difference between the three levels of participation on 2017 annual GPA at the $p < .05$ [$F(2,201) = 3.62, p = 0.027$].

Post hoc Tukey HSD comparisons indicated that average 2017 GPA for students who had two-years of B.L.A.C.K. participation ($M = 2.42, SD = .696$) was significantly different from the control (no participation) group ($M = 1.96, SD = .934$). However, the 1-year participation group ($M = 2.13, SD = .754$) did not differ significantly from either group. Taken together, this suggests that in order to see the observed gains in annual GPA, students generally need to be enrolled in the course for two years. Another way to consider this is that, on average, we would expect a .17 annual increase in GPA as a result of participating in the B.L.A.C.K. course (or .68 over the course of high school), but students would need at least two years of participation in order to see that effect.

Conclusions and Next Steps

Though the effects could be described as small-to-medium, there was a consistent program effect observed for annual GPA among continuously enrolled B.L.A.C.K. students. Figure 4 show the general trajectory for participants, control and district-wide African American male averages on annual GPA. Results of the analysis show that on average, the B.L.A.C.K. students saw an annual increase of .125 GPA points as a result of participation in the course.

When considered in terms of dosage, this figures rises to .171 if the student has been in the program for two full years. In other words, over the course of high school this observed effect could translate to an increase in African American male students' cumulative graduating GPA between .50 to .68 points. Given that the average district-wide GPA for African American males is 2.28 at the end of grade 9, this could translate to a senior GPA improvement ranging from 2.78 to 2.96. Depending on where a student starts, this could have major implications for both college placement and the type of college a student might be eligible to attend.

Figure 4. Annual GPA Trends for MPA African American (non-ELL) Boys

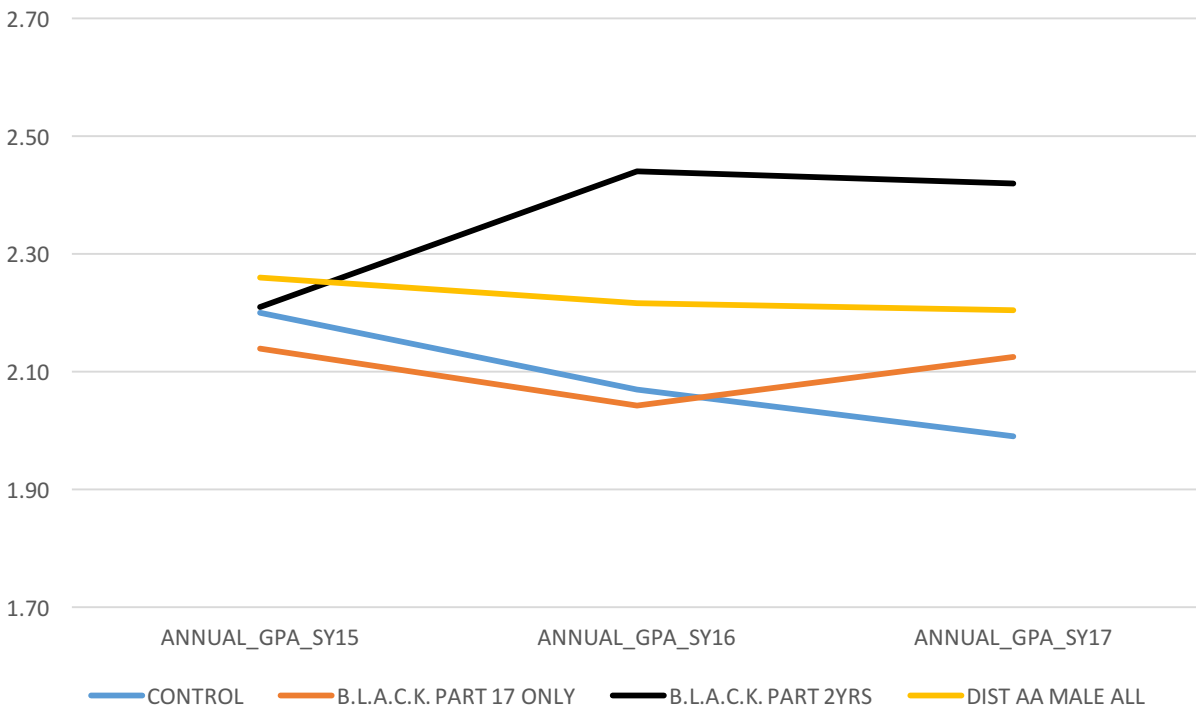
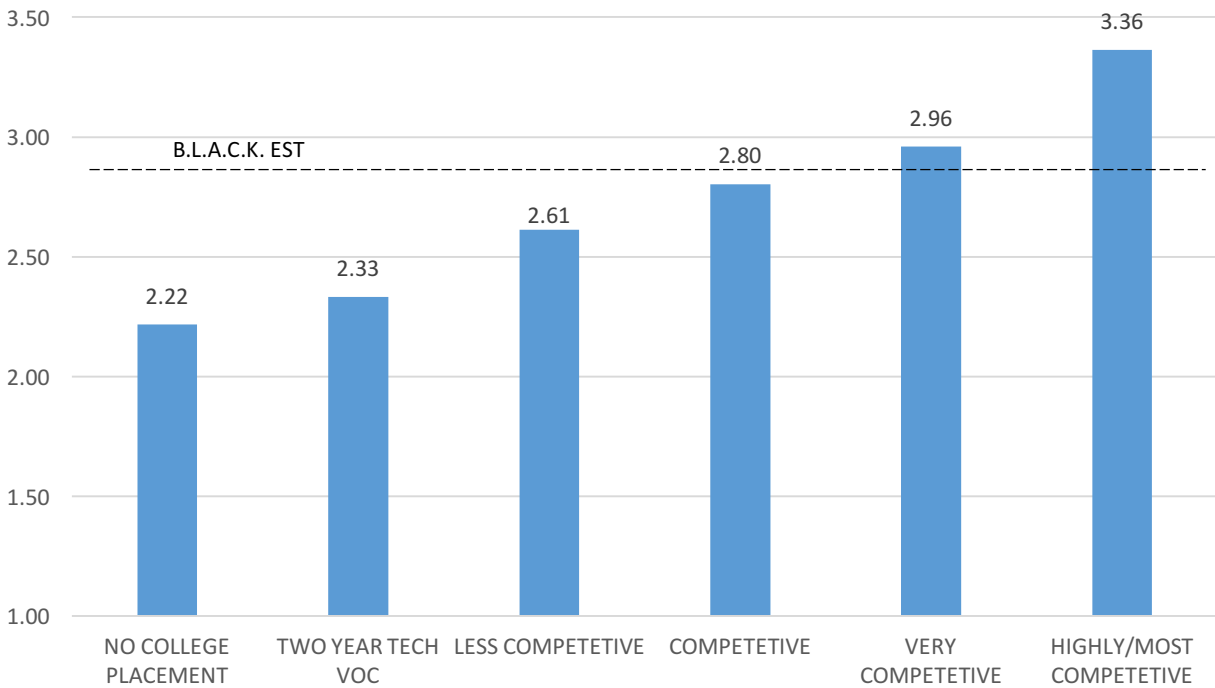
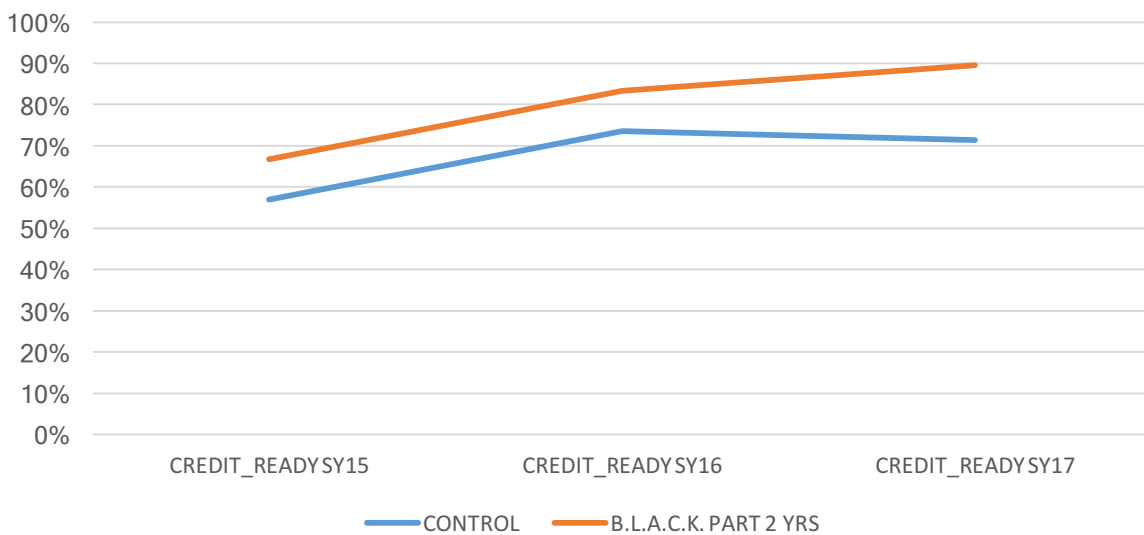


Figure 5 shows the average MPS cumulative GPA for African American boys by the type of college they first attended after graduation. College type is defined by using the National Student Clearing House college codes in combination with Barron's college selectivity ratings.

Figure 5. MPS African American Males Average HS GPA by College Placement Type SY2010-2016



Finally, it was of interest to learn something about program impact on success toward graduation. While it is too early in the program cycle to measure direct impact on actual graduation rates, credit readiness is considered an important indicator. Here, a significant effect was found for the distribution of high school students who were credit-ready in B.L.A.C.K. course compared to the control group. Figure 6 shows the proportion of students who were credit ready by school year.




Further Research

During the course, students are learning about their history and developing their racial identity. Anecdotally, we know that some students have increased in recorded behavior incidences (and also decreased attendance) due to them questioning the system more than they have in the past. Based on the research in racial identity development, we understand that students may look worse on certain measures (like behavior and attendance) before they start to improve. More time is needed to see the long term impact of the program on these measures.

In addition, over time, the program will have an increasing number of students who are scheduled for graduation and making post-secondary decisions. The program will continue to track and investigate these measures as well, but cannot at this time due to the infancy of the program.

Appendix A. Enrollment in the B.L.A.C.K. Course and Comparison to African American Males Not Enrolled in the Course, SY15-16

		Office of Black Male Student Achievement (OBMSA) Building Lives Acquiring Cultural Knowledge (BLACK) Course Fact Sheet											
Demographic Information													
Students in BLACK Class	N=169		School	N	%	Students in BLACK Class vs. Other African American Males							
Grades	N	%	FIELD	26	15%			BLACK[1]		AAM[2]			
6 th grade	3	2%	FOLWELL ARTS	11	7%			N	%	N			
7 th grade	24	14%	NORTHEAST	27	16%	Free/Reduced Lunch		147	87%	1793	85%		
8 th grade	62	37%	FRANKLIN	26	15%	Student with a disability		56	33%	733	35%		
9 th grade	25	15%	EDISON	17	10%	Homeless/Highly mobile		16	10%	272	13%		
10 th grade	18	11%	SOUTH	23	14%	Gifted/Talented		7	4%	103	5%		
11 th grade	14	8%	NORTH ACAD	28	17%								
12 th grade	23	14%	HARRISON SEC	11	7%								
				169									
Academic & Social/Emotional Outcomes				2014-15 Quarter 4		2015-16 Quarter 1		2015-16 Quarter 2		2015-16 Quarter 3		2015-16 Quarter 4	
BLACK Course vs. Other AAM		BLACK	AAM	BLACK	AAM	BLACK	AAM	BLACK	AAM	BLACK	AAM	BLACK	AAM
GPA		N	N										
Average GPA (Middle and High)		138	2114	1.60	1.63	2.06	2.02	2.08	1.96	2.15	1.93	1.92	1.85
Average GPA, Middle School		76	879	1.86	2.03	2.15	2.31	2.16	2.20	2.73	2.22	2.02	2.05
Average GPA, High School		62	1235	1.27	1.43	2.00	1.92	1.99	1.80	1.90	1.83	1.81	1.71
Attendance													
Average % Attendance		129	2142	91.9%	90.7%	93.7%	92.2%	91.7%	90.0%	86.9%	88.4%	87.8%	87.9%
Behavior													
% one or more Suspensions		43	315	28%	18%	5%	4%	21%	9%	31%	15%	39%	21%
% one or more Referrals		70	772	63%	46%	17%	11%	23%	17%	27%	20%	46%	30%
Advanced Coursework													
% Take & Pass AP/IB, 9 th Grade		19	320	NA	NA	0.0%	9.3%	0.0%	10.6%	0.0%	9.1%	0.0%	9.6%
% Take & Pass AP/IB, 10 th Grade		12	322	0.0%	8.1%	7.1%	13.4%	14.3%	11.9%	16.7%	11.2%	11.1%	12.1%
% Take & Pass AP/IB, 11 th Grade		11	296	0.0%	12.7%	27.3%	31.0%	36.4%	30.0%	36.4%	31.4%	21.4%	31.2%
% Take & Pass AP/IB, 12 th Grade		20	297	26.3%	21.6%	15.8%	20.1%	15.8%	18.4%	5.0%	19.2%	13.0%	19.8%
<p>[1] BLACK indicates students in the Office of Black Male Student Achievement BLACK course.</p> <p>[2] AAM stands for African American Males, which represents all middle- and high-school African American Males who have English as their home language.</p>													