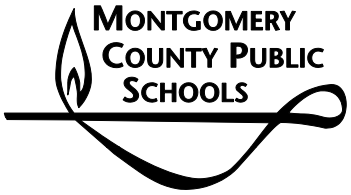

Academic Success of Montgomery College Students in the Achieving Collegiate Excellence and Success (ACES) Program: 2014–2015

Office of Shared Accountability

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Executive Summary

The Office of Shared Accountability in Montgomery County Public Schools (MCPS) is conducting a multiyear evaluation of the Achieving Collegiate Excellence and Success (ACES) program. The ACES program is a collaboration between MCPS, Montgomery College (MC), and the Universities at Shady Grove to create a seamless pathway from high school to college completion. It focuses on identifying and supporting both students who are underrepresented in higher education and those who would be the first in their family to attend college. A central element to the ACES program is the presence of coaches at each institution. School year 2014–2015 was Year Two of the ACES program and the first year with students at MC. These students participated in Year One of ACES as 12th graders and graduated from MCPS in 2014.

As one of a series of reports about Year Two of ACES, this document concerns the first year of participants at MC and addresses the following outcome evaluation questions:

1. What is the academic success of the ACES students at MC?
2. Are there variations in academic success among subgroups of ACES students at MC? Subgroups included race/ethnicity and services received in high school.
3. Are there differences in academic success between ACES students and a comparison group of students at MC?

Summary of Methodology

This study analyzed measures of academic success for the 329 students who were enrolled in the ACES program at MC for the 2014–2015 year. Data were gathered from ACES program staff, MC student-level records, and MCPS student-level records. Descriptive analyses were used to answer questions 1 and 2. To answer question 3, a matched sample of students was identified using multivariate statistical techniques and drawn from all MCPS students who graduated in 2014 and enrolled at MC during 2014–2015. Regression analyses, with tests of both statistical and practical significance, were used to answer question 3.

Summary of Findings

Question 1. ACES students, like all enrollees at MC, must demonstrate readiness for college-level, credit-bearing courses in English and mathematics through test scores from the ACT, SAT, or ACCUPLACER test. Students who do not qualify are directed to preparatory classes that do not earn college credit. Five out of six ACES students enrolled in one or more preparatory courses. The most frequent type of preparatory course was developmental, which are prerequisites to credit-bearing courses. Seven out of ten ACES students enrolled in at least one developmental course and earned passing grades in 70% of them. A second type of preparatory course is American English Language Program (AELP), designed for non-native speakers of American English. One fifth of ACES students enrolled in at least one AELP course and passed more than 90% of them.

Almost all ACES students enrolled in at least one college-credit course and earned passing grades in more than 85% of those courses. Further, more than three quarters of ACES students achieved good academic standing, defined as a grade point average (GPA) of C or higher in college-credit courses, at the end of the last term of their first year at MC.

With respect to academic progress, spring retention was high; almost all ACES students who first enrolled at MC in summer or fall of 2014 enrolled again for the spring semester of 2015. Across all ACES students, the mean number of college credits earned for the 2014–2015 school year at MC was 11.8, and the median number was 10. Lastly, more than eight out of ten ACES students received financial aid.

Question 2. With respect to variations in academic performance across racial/ethnic subgroups, Asian students had lower levels of enrollment and achievement in developmental (i.e., noncredit) courses, but higher GPA in college-credit courses. Students in both the Asian and Black or African American subgroups earned fewer college credits than other subgroups.

Compared to other groups who received services in high school, students who received special education services as high school seniors had lower levels of success in three areas: achievement in developmental courses, achievement in college-credit courses, and academic progress (i.e., spring retention, earned college credits). Also, more students who received English for Speakers of Other Languages (ESOL) services as high school seniors enrolled in preparatory courses designed for non-native speakers of American English. This subgroup earned fewer college credits but had higher levels of achievement in the college-credit courses they did complete versus other service receipt subgroups. Lastly, students who received ESOL services prior to senior year in high school were more successful, compared to other service receipt subgroups, in achievement in developmental courses, achievement in college-credit courses, and earning college credits.

Question 3. There were several significant differences in academic success between ACES students and the comparison group of non-ACES students. ACES students were more likely to enroll in any type of preparatory (i.e., noncredit) course and also more likely to enroll in one type, developmental. Further, the passing rate was higher for developmental courses taken by ACES students than for those taken by the comparison students.

The significant differences between ACES and comparison students with respect to college-credit courses were quite positive. ACES students were more likely to enroll in college-credit courses and had a higher GPA in those courses. Also, the pass rate for college-credit courses taken by ACES students was higher than the pass rate for courses taken by comparison students. Further, ACES students made more academic progress than the comparison students: they were more likely to return for spring semester and earned more college credits during their first year at MC.

ACES students were significantly more likely to receive financial aid than comparison students.

Conclusion

There were many positive outcomes for the first group of ACES students at MC. Almost all of them enrolled in at least one college-credit course and were largely successful, in terms of academic standing, mean GPA, and pass rate. Spring retention was very high. More than eight out of ten ACES students received financial aid. Further, ACES students significantly outperformed a matched group of comparison students on all of these measures: enrollment in college-credit courses, mean GPA, pass rate for college-credit courses, spring retention, and receipt of financial aid. However, compared with other service receipt subgroups, ACES students who received special education services as high school seniors were less successful on multiple

measures. Further, almost all ACES students enrolled in at least one preparatory course and were more likely do so than non-ACES students. The high enrollment rate in preparatory courses is an area of concern because these courses, although required for certain students, do not earn college credits but cost students money, delay the time to graduation, and may discourage students from staying in college. On a more positive note, the pass rate for developmental courses (one type of preparatory course) was higher for those completed by ACES students than for those completed by comparison students. One of the measures of success for ACES students who enroll at MC is graduation with an associate's degree that requires approximately 60 college credits. On average, ACES students earned less than one quarter of that goal (12 credits) in their first year at MC, although they did earn significantly more credits than the comparison students who averaged only 9 credits in their first year at MC. Based on comparisons between ACES students and the non-ACES group, the largest impacts of the program were on spring semester retention and receipt of financial aid.

Academic Success of Montgomery College Students in the Achieving Collegiate Excellence and Success (ACES) Program: 2014–2015

Achieving Collegiate Excellence and Success (ACES) is a collaborative effort among Montgomery County Public Schools (MCPS), Montgomery College (MC), and the Universities at Shady Grove (USG). According to a Memorandum of Understanding between the three institutions, MCPS will lead the design of research protocols in consultation with all partners to evaluate the effectiveness of the program (MCPS, MC, & USG, 2013). Consequently, the Office of Shared Accountability in MCPS is conducting a multiyear evaluation of the ACES program. The principal goal for the evaluation is to provide valid and reliable information on the ACES program implementation processes and outcomes. As one of a series of evaluation reports about Year Two of the ACES program, this document addresses the outcome evaluation questions for the first year of participants at MC.

Program Description

MCPS collaborated with MC and USG to create the ACES program. Using a case management approach, the ACES program seeks to create a seamless pathway from high school to college completion. This program focuses on identifying and supporting both students who come from backgrounds that are underrepresented in higher education and those who would be the first in their family to attend college.

A central element to the ACES program is the presence of coaches (at each institution) who mentor, advocate, and advise ACES students in four areas: college planning, academics, career development, and personal/social. Coaches are expected to plan and provide activities and workshops, make referrals to other services, and work one-on-one with students. ACES coaches also should build ongoing support between the students and counselors, faculty members, and peers across educational institutions to sustain students throughout their educational experience.

The ACES program begins in high school, when students apply to the program in the fall semester of 10th grade. Each participant meets one or more of the following risk factors: member of an underrepresented race/ethnicity group in higher education (such as Black or African American, or Hispanic/Latino students); low income or single parent household; first generation college student; students in special education; immigrant or child of immigrant parents; homeless students or those living in unstable conditions. At each participating high school, approximately 60 students enter the program during Grade 11 and continue into Grade 12. For students who attend MC and eventually USG, the program continues until they graduate.

College Component

School year 2014–2015 was the first year that ACES students attended MC. These students participated in Year One (2013–2014) of the ACES program as 12th graders at one of the 10 participating high schools and graduated from MCPS in 2014. (More detail on the high school component of ACES is in Wolanin and Modarresi, 2015.)

To support ACES students, the ACES coaches at MC, in collaboration with other staff at MC, were expected to provide the following activities:

- Summer orientation for all students, including sessions at each MC campus
- Regular communication from MC coaches to students through e-mails and phone calls
- Workshops throughout the year on a variety of topics
- Tracking of student progress and recommending referrals (e.g., internally for counseling or externally to social services)
- Identification and support in overcoming barriers to program completion (e.g., transportation, finances, housing, health)
- Individual meetings between coach and each student, at least once per semester
- Assistance in completing financial aid and scholarship application forms
- Visits to USG and other University System of Maryland campuses/access to activities

ACES students may take advantage of tutoring at MC, guest matriculation (i.e., permission to enroll) at USG while completing a degree at MC, and guaranteed admission to a University System of Maryland institution with an Associate of Arts or Sciences degree. Students who attend USG after MC will continue to receive support from an assigned ACES coach.

The program's goal was to have one full-time ACES coach assigned to each of the three MC campuses: Germantown, Rockville, and Takoma Park. However, the coach at the Takoma Park/Silver Spring campus was the only coach in place until December 2014, when two coaches were hired for the other two MC campuses.

Information on implementation of the ACES program during its first year at MC is available in a separate report (Cooper-Martin, 2016).

Expected Student Outcomes

In the Memorandum of Understanding, MCPS, MC, and USG (2013) identified the following goals for each student in the ACES program:

- Gain admission to a college or university
- Succeed and graduate from MC, if enrolled
- Complete a bachelor's degree

Measures of interest for student progress include earned credit hours at college, retention (e.g., from first year to second semester at college), and grade point average (GPA). Measures of success at college include transfer from a 2-year to a 4-year college and graduation from college within six years of high school graduation.

Scope of the Current Study

The evaluation has two major goals: 1) to provide formative information on the extent to which the ACES activities were implemented as designed and 2) to analyze the extent to which the ACES program achieved its expected outcomes. Evaluation questions were developed in collaboration with ACES program administrators. An earlier report addressed formative evaluation questions with respect to the first year of the ACES program at MC (Cooper-Martin, 2016).

This report addresses the following outcome evaluation questions with respect to the ACES program at MC.

1. What is the academic success of the ACES students at MC?
2. Are there variations in academic success among subgroups of ACES students at MC?
3. Are there differences in academic success between ACES students and a comparison group of students at MC?

Methodology

Study Population

This report includes 329 ACES students enrolled at MC during 2014–2015. Each student met the following criteria: participated in Year One of ACES as a 12th grader, graduated from MCPS in 2014, and enrolled at MC in credit or noncredit courses for at least one of the following terms:

- Summer session I 2014
- Summer session II 2014
- Fall semester 2014
- Winter term 2015
- Spring semester 2015
- Summer session I 2015.

The total of 329 students represents 59% of the 558 students who participated in ACES as 12th graders during the 2013–2014 school year and graduated from MCPS in 2014. Note that 330 of the ACES participants who graduated from MCPS in 2014 reported plans to attend MC after graduation; however, this does not mean that almost all students who planned to attend MC actually did so. Of the 330 ACES graduates who indicated plans to attend MC, 205 actually enrolled (62%). The remaining 124 ACES students who enrolled at MC did not report plans to do so at the end of their senior year in high school.

Descriptors for the study population are in Table 1. The majority of ACES students at MC were female (56%). One half were Hispanic/Latino (50%) and one third (33%) were Black or African American. The remainder were Asian (9%), White (6%), or Two or More Races (2%). Based on data from the beginning of their senior year at MCPS, over one half of students received Free and Reduced-price Meal System (FARMS) services (57%), one eighth (13%) received special

education services, and one tenth received English for Speakers of Other Languages (ESOL) services (10%). (MCPS indicators for services were used because there were not similar indicators from MC.) An additional 13% had received ESOL services prior to their senior year. Just over one half of the ACES students (51%) identified themselves on the ACES application as first generation to go to college, based on the following question: Do you have at least one parent/legal guardian who graduated from college in the U.S.?

Table 1
Characteristics of ACES Students at MC, 2014–2015

Characteristics (N = 329)	*n*	%
Gender		
Female	184	55.9
Male	145	44.1
Race/ethnicity		
Asian	31	9.4
Black or African American	107	32.5
Hispanic/Latino	164	49.8
White	21	6.4
Two or More Races	6	1.8
Services received in high school as of 09/13		
Current FARMS	187	56.8
Current special education	43	13.1
Current ESOL	33	10.0
Prior ESOL	42	12.8
Other		
First generation to go to college	169	51.4

Measures of Academic Success

Measures of academic success focused on the following areas:

- Enrollment in preparatory (i.e., noncredit) courses and college-credit courses
- Achievement in preparatory courses and college-credit courses
- Academic progress (i.e., progress in earning college credits)
- Receipt of financial aid

Preparatory courses are MC courses that do not earn college credits, but prepare students for success in college-credit courses. They are an area of concern because these courses cost students money for tuition, delay the time to graduation, and discourage students from staying in college. This report examined enrollment and achievement in three types of preparatory courses at MC:

- American English Language Program courses are designed to meet the language and academic cultural-adaptation needs of non-native speakers of American English.
- Developmental courses are required as prerequisites to credit-bearing courses.
- Workforce Development & Continuing Education courses include courses to improve reading, writing, and grammar skills or provide life skills and career planning.

Data Collection Activities

Staff at MC provided student-level records of academic performance, enrollment history, receipt of financial aid, and students' status as first generation to go to college. (Students indicated whether they were first generation on their applications to the ACES program.) Student-level records from appropriate MCPS databases were downloaded to provide the following data: gender, race/ethnicity, and receipt of the following services in high school: English for Speakers of Other Languages (ESOL), Free and Reduced-price Meal System (FARMS), and special education.

Design

A nonexperimental design was used to answer questions 1 and 2.

To answer question 3, on possible differences in achievement between ACES students and a comparison group of students, a quasi-experimental design was used. An individually matched sample of nonparticipants was identified as a comparison group, using multivariate statistical techniques. The sample was drawn from all MCPS students who, like the ACES participants, graduated in 2014 and enrolled at MC during 2014–2015. The goal was to identify a comparison student for each ACES student by matching on the following demographic characteristics: race/ethnicity and receipt of ESOL, FARMS, and special education services in high school.

Matching was done using propensity scores and the matching component available through IBM SPSS Statistics software. Comparison students were identified for 325 of the 329 ACES students; no matches were available for two ACES students who received ESOL as seniors in high school. Also, two comparison students (and their matching ACES students) were eliminated because they registered but did not enroll at MC. The demographic characteristics and service receipt status of the resulting samples of ACES participants and nonparticipants were very similar (see Table A1, Appendix A). Thus, the analytical sample for question 3 included 325 ACES and 325 comparison students. The propensity scores from the analytical sample were divided into quintiles (i.e., five categories) and incorporated into the analysis, as described below.

High school GPA or PSAT scores were not used as a criterion for matching, because doing so excluded 74 or more students; to keep as many ACES students as possible in the analysis, matching was done based only on the four demographic traits listed above. However, as noted below, high school GPA was included in the analyses as a covariate, to control for possible differences in ability prior to enrollment at MC.

Analytical Procedures

Descriptive statistics were used for question 1 and question 2. Regression analysis was used for question 3 to test for differences in achievement between ACES students and the comparison group of students. Each regression included the following covariates to control additionally (i.e., beyond the matching between participants and nonparticipants) for differences in these student characteristics: gender, race/ethnicity, receipt of FARMS services, receipt of special education services, receipt of ESOL services, propensity score quintile category, and high-school GPA. The latter served as a measure of the initial ability of each student. For all regression analyses, tests of

statistical significance were calculated to judge whether the observed relationship between participation in ACES and student achievement occurred by chance. Also, tests of practical significance were calculated to judge whether the observed relationships were large enough to be useful to program staff (American Psychological Association, 2001). Effect sizes were used as tests of practical significance.

Multiple regression was used for measures of achievement that were continuous, meaning they had a wide range of values with the same distance between values (i.e., a ratio scale); for example, the number of college credits that a student earned. For multiple regression analyses, standardized regression coefficients (β values) were used as an effect size measure (Kline, 2005). To interpret the magnitude of β values, the following guidelines from Cohen (1988) were used: .10, .30, and .50 which correspond to small, medium, and large effect sizes, respectively.

Logistic regression was used for measures of achievement that are dichotomous, meaning they had only two values; for example, whether or not students were in good academic standing. For logistic regression analyses, odds ratios were converted to Cohen's *d* and used as an effect size measure. To interpret the magnitude of *d*, the following guidelines from Cohen (1988) were used: .20, .50, and .80 corresponding to small, medium, and large effect sizes, respectively. As recommended by Hosmer and Lemeshow (2000), if the number of cases (e.g., students) was fewer than 400, chi square tests (χ^2) were used instead of logistic regression.

Strengths and Limitations of the Methodology

One strength of this study is that the analyses included all or nearly all ACES students at MC and ensured the external validity of results. Further, the analysis for question 3 incorporated two techniques that improved the internal validity of the results; the first one was a quasi-experimental design with an individually-matched comparison group that was very similar to the ACES group on demographic characteristics. The second technique was multivariate analyses (i.e., multiple regression or logistic regression) that controlled for differences between the groups of students in demographic characteristics or high school GPA.

One limitation of this study is that information on a student's status as first generation to go to college was based on students' self-report on the ACES application. Further, there was no information on whether comparison students were first generation, because these students did not complete an ACES application. Therefore, the samples were not matched on this variable.

Lastly, it should be noted that causality may not be inferred from this study due to the lack of an experimental design.

Results

Findings for Question 1: What is the academic success of the ACES students at MC?

Enrollment in Preparatory and College-Credit Courses

Preparatory courses. ACES students, like all enrollees at MC, must demonstrate readiness for college-level, credit-bearing courses in English and mathematics through test scores from the ACT, SAT, or ACCUPLACER test. Students who do not qualify are directed to preparatory classes that do not earn college credit. A large majority of ACES students, five out of six (n = 282, 86%), enrolled in at least one of the following three types of preparatory courses.

- American English Language Program (AELP) courses are designed to meet the language and academic cultural-adaptation needs of non-native speakers of American English.
- Developmental courses are required as prerequisites to credit-bearing courses.
- Workforce Development & Continuing Education (WD & CE) courses include courses to improve reading, writing, and grammar skills or provide life skills and career planning.

Specifically, one fifth of ACES students (66, 20%) enrolled in at least one AELP course (Figure 1.1). Among the three types of preparatory courses, the most common one was developmental; the majority of ACES students, seven out of ten (234, 71%), enrolled in at least one such course. (Note that students could enroll in both AELP and developmental preparatory courses.) Lastly, nine ACES students (0.3%) enrolled in only WD & CE courses.

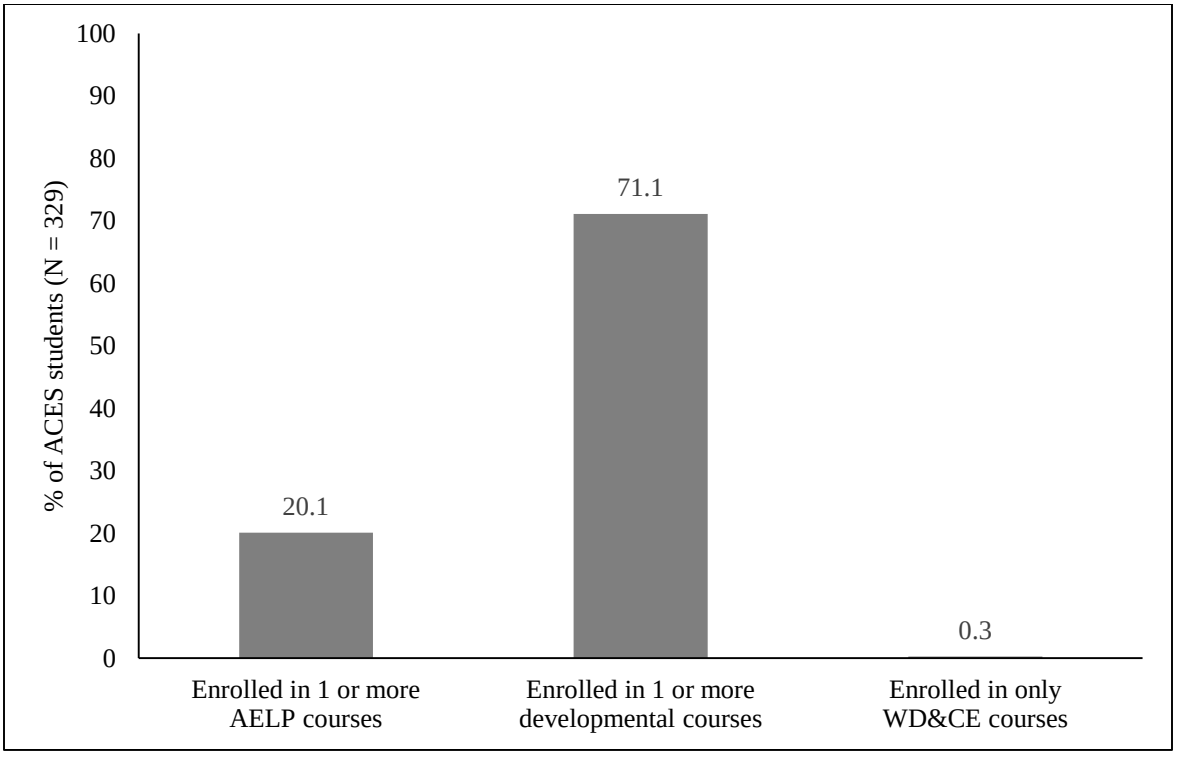

Figure 1.1. Enrollment in three types of preparatory courses for ACES students, 2014–2015.
Note. Students could enroll in both AELP and developmental preparatory courses.

College-credit courses. Almost all ACES students (303, 92%) enrolled in at least one college-credit course (Figure 1.2). The remaining 8% of students did not enroll in any college-credit courses but enrolled in only preparatory, noncredit courses at MC.

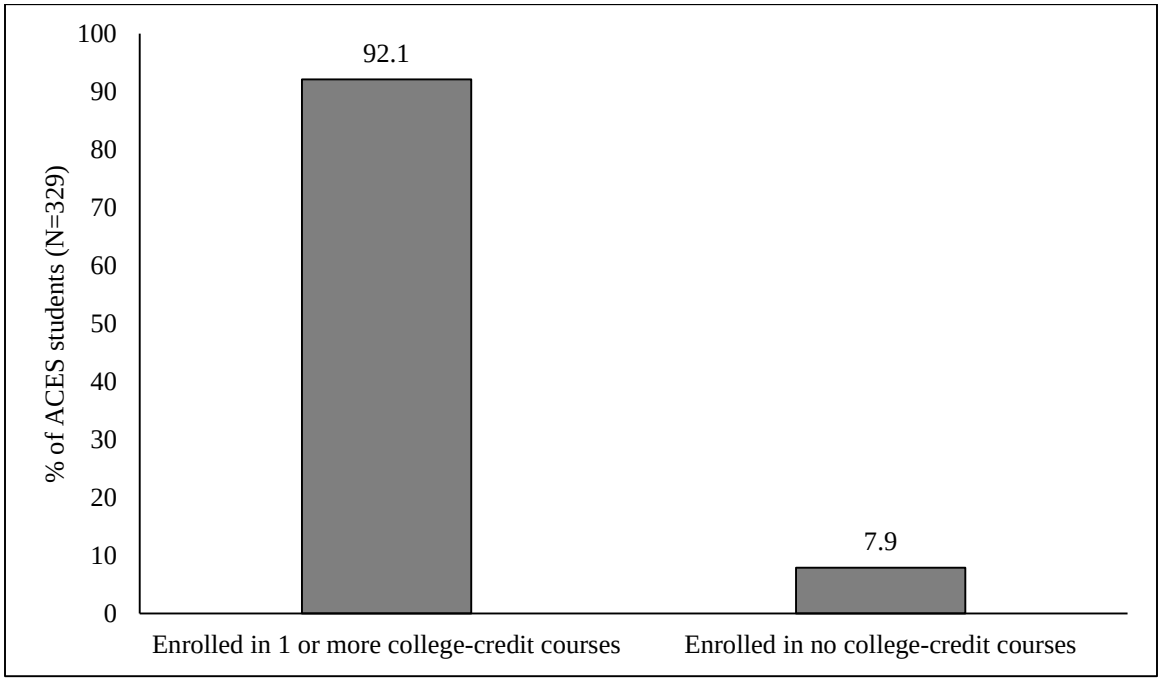

Figure 1.2. Enrollment in college-credit courses for ACES students, 2014–2015.

Achievement in Preparatory and College-Credit Courses

Pass rate. The first set of findings on course achievement used pass rate, which referred to whether a student earned a D or higher in the course. The analyses of pass rate used courses as the unit of analysis, not students, because students varied in the number of courses in which they enrolled. For example, with respect to college-credit courses, the range among ACES students who enrolled in at least one college-credit course was 1 to 15 courses per student. Thus, in total, ACES students enrolled in 1,548 college-credit courses in 2014–2015. The analyses for pass rate also included the two most common types of preparatory courses: AELP and developmental. With respect to the former, individual ACES students enrolled in one to five such courses for a an overall total of 218 AELP courses. Among ACES students who enrolled in at least one developmental course, the range was one to seven courses for a total of 557 developmental courses.

Figure 1.3 presents the pass rate for each of the three types of courses. ACES students passed almost all of the AELP courses in which they enrolled (204 courses, 94%). The pass rate was lower for developmental courses; in almost seven out of ten of these courses, ACES students earned passing grades (385 courses, 69%). Lastly, ACES students earned passing grades in more than five out of six of their college-credit courses (1,346 courses; 87%).

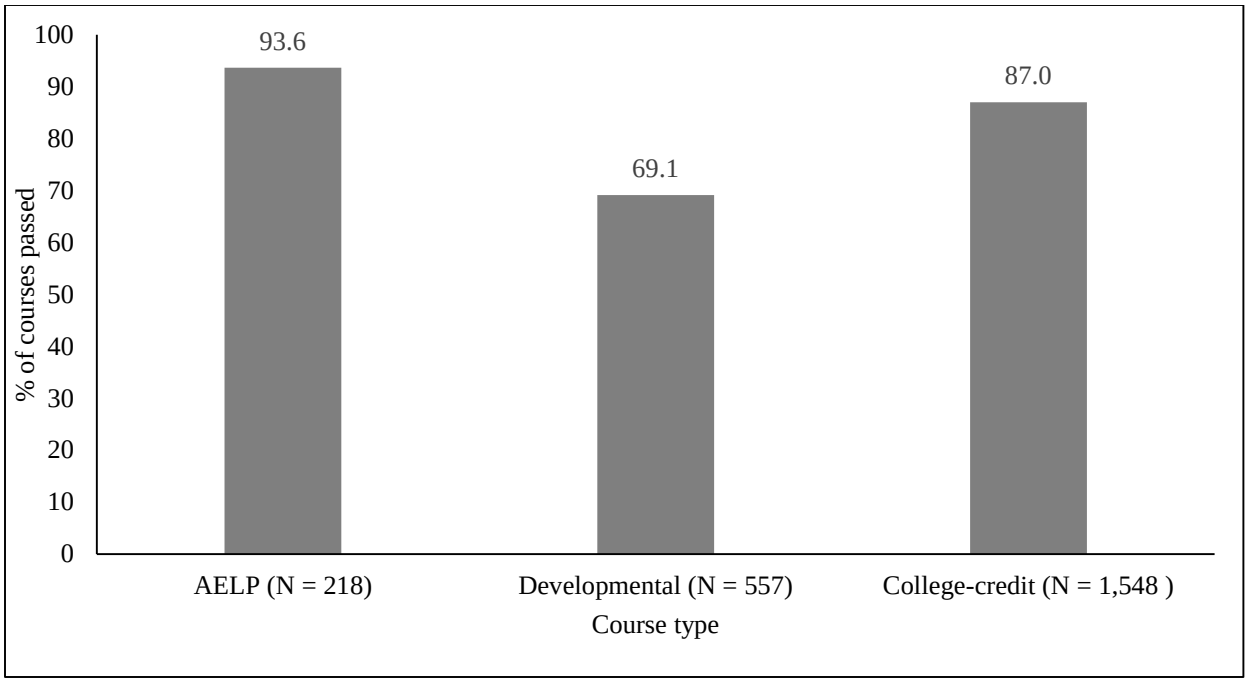

Figure 1.3. Pass rate for courses taken by ACES students by three types of courses, 2014–2015.
Note. N refers to number of courses.

GPA. Further analysis of course achievement utilized GPA and included only college-credit courses, because GPA at MC only reflects grades earned in college-credit courses. To calculate GPA, MC uses the following values:

- A = 4.0
- B = 3.0
- C = 2.0
- D = 1.0
- F = 0.

The findings on GPA used students as the unit of analysis, not courses, and included only the 303 ACES students who enrolled in at least one college-credit course. Based on this group of 303 students, statistics for GPA at the end of each student's last term in 2014–2015 were:

- Mean GPA: 2.42
- Median GPA: 2.64
- Standard deviation in GPA: 1.08

An MC measure of academic performance that reflects GPA is good academic standing, which the college defines as a cumulative GPA of 2.0 or better. Out of the 303 students who enrolled in college-credit courses, more than three quarters of them (233, 77%) achieved good academic standing at the end of their last term (Figure 1.4). Further, four out of ten students who enrolled in one or more college-credit courses (122, 40%) earned a GPA of 3.0 or higher (i.e., B or above). (Note that students who earned a GPA of 3.0 or higher also achieved good academic standing.)

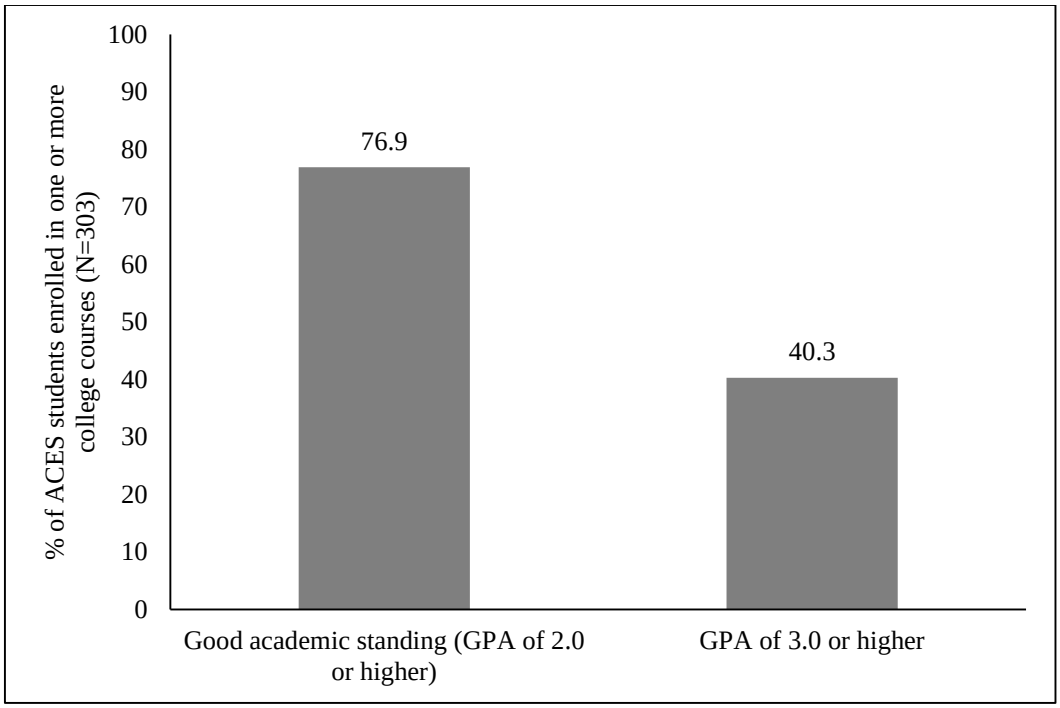

Figure 1.4. Performance in college-credit courses for ACES students in 2014–2015.
Note. Limited to students who enrolled in at least one college-credit course.

Academic Progress

Spring semester retention. The first term of enrollment at MC for almost all (304 out of 329) ACES students was summer session 1 2014, summer session 2 2014, or fall semester 2014. Out of this group of 304, almost all, 281 (92%), enrolled again for the spring semester 2015.

College credits earned. Statistics were calculated across all 329 ACES students for college credits earned (i.e., passed the course) during the 2014–2015 school year, as follows:

- Mean credits earned: 11.8
- Median credits earned: 10.0
- Standard deviation of credits earned: 9.6

Given that an associate's degree at MC requires approximately 60 college credits, ACES students, on average, were less than one quarter of the way towards that goal by the end of their first school year at MC.

Full-time vs. part-time. Further analysis of students' academic progress separated full-time and part-time students, based on fall semester enrollment. MC defines full-time students as those who enroll in 12 or more course hours in AELP, developmental, or college-credit courses during a fall (or spring) semester. Using this definition, the 292 ACES students who enrolled in fall semester 2014 included 215 full-time (74%), 71 part-time (24%) (i.e., enrolled in less than 12 course hours), and 6 (2%) not classified because they enrolled in only WD & CE courses.

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As a measure of academic progress, program staff proposed an examination of whether part-time students earned at least 12 college credits (i.e., equal to one full-time semester) by the end of the year and whether full-time students earned at least 24 college credits (i.e., equal to two full-time semesters) by the end of the year.

Using these criteria, about one fifth (15, 21%) of those ACES students enrolled part-time for the fall semester did earn 12 or more college credits by the end of the year (Figure 1.5). Among those ACES students enrolled full-time for the fall semester, a similar percentage, about one fifth (47, 22%), earned 24 college credits or more by the end of the year.

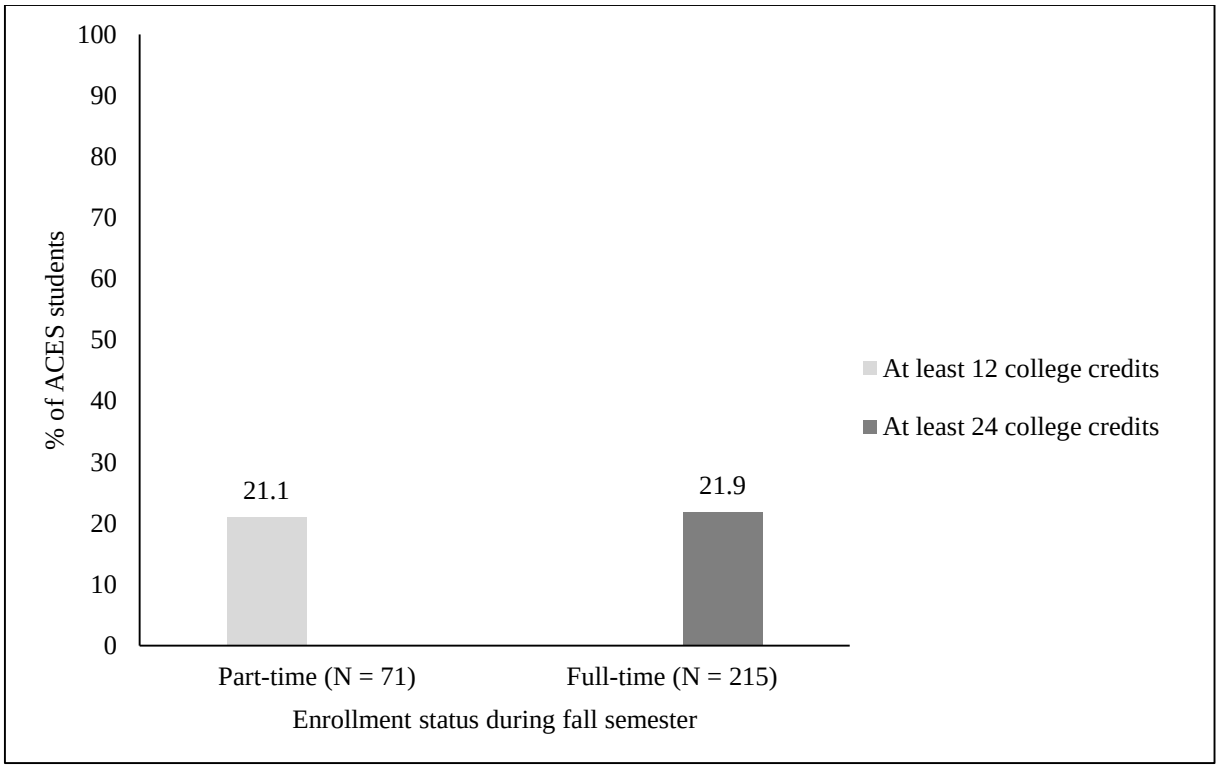

Figure 1.5. Earned college credits for ACES students by the end of 2014–2015 by enrollment status in fall semester.

Receipt of Financial Aid

More than three quarters (269, 82%) of all ACES students received financial aid in the form of grants, loans, or scholarships. Among the 269 students who received aid, about two thirds received at least one grant (172, 64%), and a similar percentage received more than one award (185, 69%). Out of the 269 ACES students who received financial aid, the frequency of receipt of various forms of aid was as follows (note that a student could receive more than one type of aid):

- 201 (75%) students received a Federal Pell Grant (with or without other aid)
- 149 (55%) students received one or more grants other than Pell Grants
- 52 (19%) students received one or more scholarships
- 30 (11%) students received one or more loans

Summary for Question 1

A large majority of ACES students, five out of six, enrolled in at least one preparatory (i.e., noncredit) course. The most common type of preparatory courses were developmental; these courses are prerequisites to credit-bearing ones. Seven out of ten ACES students enrolled in at least one developmental course; they earned passing grades in 70% of their developmental courses.

Almost all ACES students enrolled in at least one college-credit course and earned passing grades in more than five out of six of those courses. Further, more than three quarters of ACES students who enrolled in at least one college-credit course achieved good academic standing (i.e., grade point average of C or higher) at the end of their last term.

With respect to academic progress, spring retention was high; almost all ACES students who first enrolled at MC in summer or fall of 2014 enrolled again for spring semester 2015. Also, across all ACES students, the mean number of credits earned for the school year was 11.8 and the median number was 10. Thus, on average, in their first year at MC, ACES students earned about one fifth of the 60 college credits[1] necessary to earn an associate's degree at MC. Lastly, more than eight out of ten of ACES students received financial aid, such as grants, loans, or scholarships.

[1] MC uses 12 credits per semester (i.e., fall or spring) as the definition of full time to comply with the federal definition of full time, even though a student would need 15 credits per semester to reach the 60 credit requirement in two years.

Findings for Question 2: Are there variations in academic success among subgroups of ACES students at MC?

The analysis included subgroups for race/ethnicity, services received at the start of senior year in high school (i.e., 09/13), and first generation college students. Thus, references to current FARMS, current ESOL, and current special education refer to services received in high school as of 09/13 and references to prior ESOL refer to services received in high school prior to 09/13.

Enrollment in Preparatory and College-Credit Courses

Preparatory courses. A large majority of all ACES students and of most subgroups enrolled in at least one preparatory course (Table 2.1). However, the enrollment rate did vary among subgroups. Among racial/ethnic subgroups, it was lowest among Asian (77%) and White (67%) students. Among service receipt groups, the rate of enrollment in preparatory courses was highest among the current (i.e., as high school seniors) ESOL subgroup (97%) and lowest among the prior (i.e., before senior year in high school) ESOL subgroup (83%).

Table 2.1
Enrollment of ACES Students in Preparatory, AELP, and Developmental Courses in 2014–2015 by Subgroups

	Enrolled in 1 or more preparatory course (any type)		Enrollment by type of preparatory course			
			Enrolled in 1 or more AELP courses		Enrolled in 1 or more developmental courses	
Group (N)	*n*	%	*n*	%	*n*	%
Total (329)	282	85.7	66	20.1	234	71.1
Race/ethnicity						
Asian (31)	24	77.4	14	45.2	13	41.9
Black or African American (107)	93	86.9	22	20.6	76	71.0
Hispanic/Latino (164)	145	88.4	28	17.1	125	76.2
White (21)	14	66.7	2	9.5	14	66.7
Services received in high school as of 09/13						
Current FARMS (187)	163	87.2	48	25.7	127	67.9
Current special education (43)	39	90.7	2	4.7	33	76.7
Current ESOL (33)	32	97.0	29	87.9	6	18.2
Prior ESOL (42)	35	83.3	25	59.5	23	54.8
First generation college student (169)	142	84.0	39	23.1	117	69.2

Note. Excludes the Two or More Races subgroup due to small size.
Students could enroll in both AELP and developmental preparatory courses.

As noted above, MC offers different types of preparatory courses; enrollment in the two most common types are included in Table 2.1 above. With respect to AELP courses (i.e., designed for non-native speakers of American English), relatively few ACES students among the total group, and likewise among most subgroups (20% or fewer), enrolled in them. The rate of enrollment in AELP courses did vary across subgroups; it was higher among Asian students (45%) than among other racial/ethnic groups. Not surprisingly, the enrollment rate for AELP courses also was higher among both the current ESOL (88%) and prior ESOL (60%) than among other service subgroups.

The majority of ACES students (about seven out of ten) enrolled in one or more developmental courses (i.e., required as prerequisites to credit-bearing courses) among all ACES students and most subgroups (Table 2.1 above). The enrollment rate in developmental courses did vary across subgroups; it was lower for Asian students (42%) than for other racial/ethnic subgroups. Across service receipt groups, the enrollment rate was lowest for the current ESOL subgroup (i.e., students who received ESOL services as seniors in high school) (18%).

College-credit courses. Almost all ACES students and almost all students in each subgroup enrolled in one or more college-credit courses (Table 2.2). The enrollment rate did not vary across racial/ethnic subgroups. Across service subgroups, the enrollment rate was lower for current ESOL students (67%) than for other subgroups.

Table 2.2
Enrollment in College-Credit Courses in 2014–2015
by Subgroups of ACES Students

		Enrolled in 1 or more college-credit courses	
Group	N	*n*	%
Total	329	303	92.1
Race/ethnicity			
Asian	31	27	87.1
Black or African American	107	100	93.5
Hispanic/Latino	164	150	91.5
White	21	20	95.2
Services received in high school as of 09/13			
Current FARMS	187	168	89.8
Current special education	43	36	83.7
Current ESOL	33	22	66.7
Prior ESOL	42	37	88.1
First generation college student	169	150	88.8

Note. Excludes the Two or More Races subgroup due to small size.

Achievement in Preparatory and College-Credit Courses

Pass rate. The first analysis of course achievement by subgroup used pass rate (i.e., whether a student earned a D or higher in the course) and courses as the unit of analysis, because students varied in the number of courses in which they enrolled. Table 2.3 presents the pass rate by subgroups in three types of courses, including two types of preparatory courses: AELP and developmental.

Table 2.3
Pass Rate in Three Types of Courses by ACES Students in 2014–2015 by Subgroups

	Pass rate AELP courses			Pass rate developmental courses			Pass rate college-credit courses		
Group	N	*n*	%	N	*n*	%	N	*n*	%
Total	218	204	93.6	557	385	69.1	1,548	1,346	87.0
Race/ethnicity									
Asian	50	48	96.0	33	21	63.6	134	116	86.6
Black or African American	79	72	91.1	180	121	67.2	471	401	85.1
Hispanic/Latino	82	77	93.9	304	216	71.1	816	715	87.6
White	2	--	--	33	24	72.7	96	87	90.6
Services received in high school as of 09/13									
Current FARMS	146	136	93.2	305	226	74.1	891	781	87.7
Current special education	2	--	--	110	71	64.5	114	100	87.7
Current ESOL	104	101	97.1	6	--	--	60	54	90.0
Prior ESOL	77	71	92.2	45	40	88.9	229	220	96.1
First generation college student (169)	122	112	91.8	285	192	67.4	796	700	87.9

Note. Due to small size, excludes the Two or More Races and results for subgroups with N < 16.
N refers to number of courses.

In almost all AELP courses (about nine out of ten), ACES students earned passing grades (Table 2.3 above). The pass rate was similar across subgroups.

With respect to developmental courses, ACES students earned passing grades in about seven out of ten of them; there were variations in success across subgroups (Table 2.3 above). Compared to the passing rate for other racial/ethnic subgroups, the rate was a little lower for Asian students (64%). Across service receipt subgroups, the pass rate was lowest for the current special education subgroup (65%) and highest for the prior ESOL subgroup (89%).

Lastly, ACES students passed a large majority (87%) of their college-credit courses; this pass rate was similar across subgroups (Table 2.3 above). The only exception was a higher passing rate for courses taken by prior ESOL students (96%) than for other service receipt subgroups.

GPA. The second analysis of course achievement by subgroup utilized GPA and included only college-credit courses, because GPA at MC only reflects grades earned in college-credit courses. The findings on GPA used students as the unit of analysis, not courses, and included only the 303 ACES students who enrolled in at least one college-credit course.

More than three quarters (77%) of all ACES students who enrolled in college-level courses achieved good academic standing (i.e., earned a GPA of 2.0 or higher); achievement on this measure was similar across racial/ethnic subgroups (Table 2.4). Across service receipt groups, the level of achievement was higher for both the current ESOL (91%) and the prior ESOL (89%) subgroups than for other subgroups.

Table 2.4
GPA Performance in College-Credit Courses in 2014–2015
by Subgroups of ACES Students

Group	*N*	Good academic standing (GPA of 2.0 or higher)		GPA of 3.0 or higher[a]	
		n	%	*n*	%
Total	303	233	76.9	122	40.3
Race/ethnicity					
Asian	27	21	77.8	14	51.9
Black or African American	100	77	77.0	40	40.0
Hispanic/Latino	150	117	78.0	59	39.3
White	20	16	80.0	8	40.0
Services received in high school as of 09/13					
Current FARMS	168	135	80.4	72	42.9
Current special education	36	27	75.0	13	36.1
Current ESOL	22	20	90.9	17	77.3
Prior ESOL	37	33	89.2	14	37.8
First generation college student	150	115	76.7	62	41.3

Note. Limited to students who enrolled in at least one college-credit course.
Excludes the Two or More Races subgroup due to small size.
[a]Students who earned GPA of 3.0 or higher also achieved good academic standing.

Further, four out of ten ACES students earned a GPA of 3.0 or higher in their college-credit courses (Table 2.4 above). There were a few variations across subgroups. More Asian students (52%) achieved a GPA of 3.0 or higher than other racial/ethnic subgroups. Also, more students in the current ESOL subgroup (77%) earned a GPA of 3.0 or higher than students in other service receipt subgroups.

Mean GPA among ACES students was 2.42 and showed some variation across subgroups (Table 2.5). Mean GPA was higher for Asian (2.57) and White students (2.54) compared to other racial/ethnic subgroups. Also, mean GPA was highest for the current ESOL subgroup (3.05) and lowest for the current special education subgroup (2.27) across the service receipt subgroups. This pattern of variations was similar for median GPA.

Table 2.5
Statistics for GPA of ACES Students in 2014–2015 by Subgroups

Group	N^a	GPA		
		Mean	Median	Standard deviation
Total	303	2.42	2.64	1.08
Race/ethnicity				
Asian	27	2.57	3.00	1.06
Black or African American	100	2.40	2.69	1.15
Hispanic/Latino	150	2.42	2.65	1.04
White	20	2.54	2.52	1.12
Services received in high school as of 09/13				
Current FARMS	168	2.54	2.72	1.03
Current special education	36	2.27	2.50	1.24
Current ESOL	22	3.05	3.23	1.07
Prior ESOL	37	2.69	2.88	0.93
First generation college student	150	2.44	2.74	1.09

Note. Excludes the Two or More Races subgroup due to small size.
[a]Limited to students who enrolled in one or more college-credit courses.

Academic Progress

Spring semester retention. Among all ACES students who first enrolled at MC for summer session I 2014, summer session II 2014, or fall semester 2014, almost all (at least nine out of ten) enrolled again for the spring semester 2015 (Table 2.6). Likewise, for almost every subgroup, almost every student returned for spring semester. The only variation was for the current special education subgroup; somewhat fewer of these students (86%) reenrolled for spring semester than other service receipt subgroups.

Table 2.6
Spring Semester Retention in 2014–2015 by Subgroups of ACES Students

		Returned for spring semester 2015	
Group	*N*[a]	*n*	%
Total	304	281	92.4
Race/ethnicity			
Asian	29	29	100.0
Black or African American	98	88	89.8
Hispanic/Latino	157	144	91.7
White	15	15	100.0
Services received in high school as of 09/13			
Current FARMS	177	162	91.5
Current special education	35	30	85.7
Current ESOL	32	30	93.8
Prior ESOL	42	40	95.2
First generation college student	156	143	91.7

Note. Excludes the Two or More Races subgroup due to small size.
[a]Limited to students who first enrolled in summer session I 2014, summer session II 2014,or fall semester 2014.

College credits earned. The mean number of earned college credits was 11.8 for all ACES students and varied across subgroups (Table 2.7). Among racial/ethnic subgroups, mean credits were lowest for the Asian and Black or African American (10.6) subgroups and highest for the Hispanic/Latino subgroup (11.5). Among the service receipt subgroups, mean credits were lowest for the current special education (6.0) and current ESOL (4.4) subgroups and highest for the prior ESOL subgroup (16.0).

Table 2.7
Statistics for Earned College Credits in 2014–2015, by Subgroups of ACES Students

		Earned college credits				
Group	*N*	Mean	Median	Standard deviation	Minimum	Maximum
Total	329	11.8	10.0	9.6	0.0	35.0
Race/ethnicity						
Asian	31	10.6	8.0	9.7	0.0	35.0
Black or African American	107	10.6	8.0	9.4	0.0	35.0
Hispanic/Latino	164	12.8	11.5	9.8	0.0	35.0
White	21	11.4	9.0	9.4	0.0	33.0
Services received in high school as of 09/13						
Current FARMS	187	12.1	11.0	9.7	0.0	35.0
Current special education	43	6.0	3.0	7.4	0.0	35.0
Current ESOL	33	4.4	3.0	6.2	0.0	26.0
Prior ESOL	42	16.0	17.0	10.6	0.0	35.0
First generation college student	169	12.1	10.0	10.3	0.0	35.0

Note. Excludes the Two or More Races subgroup due to small size.

The median number of credits was 10.0 for all ACES students and varied across subgroups in the same pattern as mean earned credits (Table 2.7 above).

Full-time vs. part-time. Among all ACES students who enrolled part-time during fall semester, about one fifth earned 12 or more college credits by the end of the year (Table 2.8). Likewise, about one fifth of the part-time students in each subgroup earned 12 or more college credits by the end of the year. An exception was the subgroup of first generation students; fewer than one fifth (14%) of part-time students in this group finished the year with 12 or more credits.

Table 2.8
Earned College Credits for ACES Students in 2014–2015,
by Fall Enrollment Status and Subgroups

	Part-time who earned 12 or more credits in 2014–2015			Full-time who earned 24 or more credits in 2014–2015		
Group	*N*	*n*	%	*N*	*n*	%
Total	71	15	21.1	215	47	21.9
Race/ethnicity						
Asian	9	--	--	18	4	22.2
Black or African American	17	4	23.5	73	10	13.7
Hispanic/Latino	39	9	23.1	110	29	26.4
White	--	--	--	10	--	--
Services received in high school as of 09/13						
Current FARMS	32	6	18.7	132	29	22.0
Current special education	14	--	--	16	1	6.3
Current ESOL	8	--	--	18	1	5.6
Prior ESOL	8	--	--	34	10	29.4
First generation college student	35	5	14.3	113	31	27.4

Note. Due to small size, excludes the Two or More Races and results for subgroups with N < 16.

Among those ACES students who enrolled full-time during fall semester, about one fifth earned 24 or more college credits by the end of the year (Table 2.8 above). Success on this measure varied across subgroups. It was lowest among racial/ethnic subgroups for Black or African American (14%) students. Across service receipt groups, the percentage who earned 24 or more college credits was lowest for students in the current special education (6%) and current ESOL (6%) subgroups and highest for the prior ESOL (29%) subgroup.

Receipt of Financial Aid

Among all ACES students, about eight out of ten (82%) received financial aid; success on this measure varied across subgroups (Table 2.9). Fewer White students (52%) than those in other racial/ethnic subgroups received financial aid, while across service receipt subgroups, fewer current special education students (70%) did so.

Table 2.9
Receipt of Financial Aid in 2014–2015 by Subgroups of ACES Students

		Received financial aid	
Group	*N*	*n*	%
Total	329	268	81.5
Race/ethnicity			
Asian	31	27	87.1
Black or African American	107	96	89.7
Hispanic/Latino	164	132	80.5
White	21	11	52.4
Services received in high school as of 09/13			
Current FARMS	187	165	88.2
Current special education	43	30	69.8
Current ESOL	33	26	78.8
Prior ESOL	42	35	83.3
First generation college student	169	140	82.8

Note. Excludes the Two or More Races subgroup due to small size.

Summary for Question 2

With respect to variations in academic performance across racial/ethnic subgroups, Asian students had lower levels of enrollment and achievement in developmental courses but higher GPA in college-credit courses. Students in both the Asian and Black or African American subgroups earned fewer college credits than other subgroups.

Compared to other service receipt groups, participants who received special education services as high school seniors had lower levels of success in three areas: achievement in developmental courses, achievement in college-credit courses, and academic progress (i.e., spring retention, earned college credits).

In comparison to other service receipt subgroups, more students who received ESOL services as high school seniors enrolled in preparatory courses designed for non-native speakers of American English. This subgroup earned fewer college credits but had higher levels of achievement in the college-credit courses they did complete versus other service receipt subgroups.

Students who received ESOL services prior to senior year in high school were more successful, compared to other service receipt subgroups, in three areas: achievement in developmental courses, achievement in college-credit courses, and earning college credits.

Findings for Question 3: Are there differences in academic success between ACES students and a comparison group of students at MC?

To test for differences in academic success between ACES and comparison students, logistic regression or multiple regression, as appropriate, was used to test for a significant relationship between participation in the ACES program and student outcomes. Effect sizes were calculated to judge whether the observed relationships were large enough to be practically useful to program staff.

Enrollment in Preparatory and College-Credit Courses

Preparatory courses. Based on the descriptive results, more ACES (86%) than comparison students (78%) enrolled in at least one type of preparatory course (Table 3.1). The results from logistic regression (odds ratio = 1.67) indicated that, after controlling for students' characteristics, the probability (or chance) of enrollment in a preparatory course was 1.67 times higher for students in the ACES group than for students in the comparison group. The odds ratio was statistically significant ($p < .05$). Also, the effect size calculated from the odds ratio was practically significant (ES > .20). These results indicated that ACES students enrolled in preparatory courses at a higher rate than their peers in the comparison group.

Table 3.1
Relationship Between Participation in ACES and Enrollment in Four Types of Courses in 2014–2015

	Descriptive statistics by group				Logistic regression results			
Enrollment in 1 or more courses	ACES (N = 325)		Comparison (N = 325)		B (standard error)	Wald	Odds ratio	Effect size (ES)
	n	%	n	%				
Preparatory (any type)	279	85.8	254	78.2	0.51 (0.22)	5.53*	1.67	0.28
AELP[a]	64	19.7	72	22.2	-0.29 (0.26)	1.24	0.75	-0.16
Developmental	233	71.7	189	58.2	0.70 (0.18)	14.89***	2.02	0.39
College credit	300	92.3	283	87.1	0.53 (0.29)	3.47	1.70	0.29

* $p < .05$, ** $p < .01$, *** $p < .001$.

Additional analysis of preparatory courses concerned the two most frequent types: AELP and developmental. About one fifth of both ACES (20%) and comparison students (22%) enrolled in at least one AELP course (Table 3.1 above). The results from logistic regression (odds ratio = 0.75) indicated that, after controlling for students' demographics and service receipt measures, the probability of enrollment in AELP courses did not differ between the two groups statistically ($p > .05$) or practically (ES < .20).

Descriptive statistics showed that more ACES (72%) than comparison students (58%) enrolled in at least one developmental course (Table 3.1 above). The results from logistic regression (odds ratio = 2.02) indicated that the chance of enrollment in a developmental course was two times higher for ACES students than for comparison students. The odds ratio was statistically significant ($p < .001$) and practically significant (ES > .20). These results showed that students in the ACES program enrolled in developmental courses at a higher rate than students in the comparison group.

College-credit courses. A higher percentage of ACES students than of comparison group students enrolled in one or more college-credit courses (Table 3.1 above). The results of the logistic regression showed that the relationship between participation in ACES and the probability of enrolling in a college-credit course was not statistically significant (odds ratio = 1.70, $p > .05$) but was practically significant (ES > .20). Thus there was evidence that ACES students were more likely to enroll in college-credit courses than the comparison group.

Further analysis suggested that ACES participants were more likely than nonparticipants to enroll in *both* preparatory and college-credit classes because they enrolled in more course hours in total than nonparticipants. The difference in the total number of course hours between participants (mean = 22.7, standard deviation = 8.5) and nonparticipants (mean = 19.2, standard deviation = 9.7) was statistically significant, based on results of a t-test ($t(648) = 5.00$, $p < .001$).

Achievement in Preparatory and College-Credit Courses

Pass rate. The first analysis of course achievement by ACES participants and nonparticipants used pass rate (i.e., whether a student earned a D or higher in the course) and courses as the unit of analysis, because students varied in the number of courses in which they enrolled. Table 3.2 presents the pass rate in three types of courses by participation in ACES, including two types of preparatory courses: AELP and developmental. Based on descriptive statistics, the pass rate for AELP courses was slightly lower for courses taken by ACES students (93%) than for those taken by comparison students (95%) (Table 3.2). Because the total number of AELP courses was too small (fewer than 400) for a logistic regression, a χ^2 test was used. It revealed no significant difference in the pass rate between the groups ($\chi^2(1) = 0.27$, $p > .05$), indicating that ACES students passed AELP courses at the same rate as comparison students.

Table 3.2
Relationship Between Participation in ACES and Pass Rate for Preparatory Courses in 2014–2015

	Descriptive statistics by group						Logistic regression results			
	Courses taken by ACES students			Courses taken by comparison students						
Pass rate by course type	N	n	%	N	n	%	B (standard error)	Wald	Odds ratio	Effect size (ES)
AELP[a]	210	196	93.3	185	175	94.6	--	--	--	--
Developmental	553	385	69.6	431	272	63.1	0.30 (0.15)	4.37*	1.36	0.17
College credit	1,531	1,331	86.9	1,273	1,061	83.3	0.35 (0.11)	9.66**	1.42	0.19

Note. N and n refer to number of courses.
[a]Regression not calculated due to small size.
* $p < .05$, ** $p < .01$, *** $p < .001$

For developmental courses, the pass rate was higher for courses taken by ACES students (70%) than for those taken by comparison students (63%) (Table 3.2 above). The logistic regression results (odds ratio = 1.36) indicated that the chance of passing a developmental course was 1.36 times higher for ACES students than for comparison students. The odds ratio was statistically significant ($p < .05$) but not practically significant (ES < .20). These results showed that ACES students passed developmental courses at a higher rate than the comparison students, but that the difference was not meaningful in an educational setting.

Lastly, the pass rate for college-credit courses was higher among courses taken by ACES students (87%) than for those taken by comparison students (83%) (Table 3.2 above). Based on logistic regression, the relationship between participation in ACES and the likelihood of passing a college-credit course was statistically significant ($p < .01$) but not practically significant (ES < .20). These results suggested that the pass rate for college-credit courses taken by ACES students was higher than for those completed by comparison students, but that the difference was not quite large enough to be meaningful in an educational setting.

GPA. The second analysis of course achievement utilized GPA and included only college-credit courses, because GPA at MC only reflects grades earned in college-credit courses. The analyses on GPA used students as the unit of analysis, not courses, and included only students who enrolled in one or more college-credit courses.

About three quarters of both ACES and comparison students were in good academic standing (i.e., earned a GPA of 2.0 or higher) at the end of their last semester (Table 3.3). The probability of being in good academic standing did not differ significantly (odds ratio=1.09, $p > .05$) or practically (ES < .20) between the two groups. Further, close to 40% of both ACES and comparison students earned a GPA of 3.0 or higher. Again, the rate of success (i.e., GPA of 3.0 or above) did not differ significantly (odds ratio=1.16, $p > .05$) or practically (ES < .20) between the two groups.

Table 3.3
Relationship Between Participation in ACES and Performance in College-Credit Courses in 2014–2015

	Descriptive statistics by group						Logistic regression results			
	ACES			Comparison						
Outcome measure	N	n	%	N	n	%	B (standard error)	Wald	Odds ratio	Effect size (ES)
Good academic standing	300	246	77.8	283	211	76.7	0.08 (0.20)	0.17	1.09	0.05
GPA of 3.0 or higher[a]	300	119	39.7	283	104	36.7	0.15 (0.19)	0.67	1.16	0.08

Note. Limited to students who enrolled in at least one college-credit course.
[a]Students who earned GPA of 3.0 or higher also achieved good academic standing.
*$p < .05$, **$p < .01$, ***$p < .001$.

ACES students had a higher mean GPA (2.41) than comparison students (2.19) (Table 3.4). Based on the results of a multiple regression that controlled for differences in student characteristics, the relationship between participation in ACES and GPA was statistically significant ($\beta = .10$, $p < .01$) and practically significant ($\beta = .10$) based on Cohen's guidelines for β values. These results indicated that ACES students, on average, had a higher GPA than comparison students.

Table 3.4
Relationship Between Participation in ACES and GPA in 2014–2015

	Descriptive statistics for GPA			Multiple regression results ($N = 572$)			
				Student group		Model fit	
Student group	N	Mean	Standard deviation	*B (SE)*	β	F (df)	adjusted R^2
ACES	300	2.41	1.08	0.22 (0.08)	0.10**	50.46***(4)	.26
Comparison	283	2.19	0.75				

Note. Limited to students who enrolled in one or more college-credit courses.
*$p < .05$, **$p < .01$, ***$p < .001$.

Academic Progress

College credits earned. The mean number of college credits earned was higher for ACES students (11.8) than for comparison students (9.4) (Table 3.6). Further, based on the results of multiple regression, the relationship between participation in ACES and college credits earned was statistically significant ($\beta = .13$, $p < .001$) and also practically significant ($\beta > .10$). These findings meant that ACES students earned significantly more college credits than comparison students.

Table 3.6
Relationship Between Participation in ACES and College Credits Earned in 2014–2015

	Descriptive statistics for college credits earned			Multiple regression results (N = 629)			
				Student group		Model fit	
Student group	N	Mean	Standard deviation	*B (SE)*	β	F (df)	adjusted R^2
ACES	325	11.80	9.59				
Comparison	325	9.35	9.67	2.55 (0.62)	0.13***	46.57 (7)***	.34

Note. Limited to students who enrolled in at least one college-credit course.
*$p < .05$, **$p < .01$, ***$p < .001$.

Full-time vs. part-time. Further analysis of students' academic progress separated full-time and part-time students based on fall semester enrollment. The outcome measure for part-time students (i.e., enrolled for less than 12 course hours in the fall) was whether they earned 12 or more college-level credits during the year. Somewhat more ACES (21%) than comparison (17%) students reached this outcome (Table 3.7). Based on a χ^2 test (because there were too few students for logistic regression), the rate of success did not differ significantly between the two groups ($\chi^2(1) = 0.55$, $p > .05$).

Table 3.7
Relationship Between Participation in ACES and Two Measures of Earned Credits in 2014–2015

	Descriptive statistics by group					
	ACES			Comparison		
Outcome measure	N	n	%	N	n	%
Earned 12 or more credits during the year (Limited to students enrolled part time in fall 2014)	70	15	21.4	106	18	17.0
Earned 24 or more credits during the year (Limited to students enrolled full time in fall 2014)	212	46	21.7	149	30	20.1

The outcome measure for full-time-students (i.e., enrolled for 12 or more course hours in the fall) was whether they earned 24 or more college-level credits during the year. As seen in Table 3.7 above, about one fifth of both ACES (22%) and comparison (20%) students met this outcome. Based on a χ^2 test, (because there were too few students for logistic regression), the rate of success did not differ significantly between the two groups ($\chi^2(1) = 0.13$, $p > .05$).

Spring semester retention. The final measure of academic progress was whether those students who first enrolled at MC for summer session I 2014, summer session II 2014, or fall semester 2014 returned for spring semester 2015. Almost all ACES students (92%) enrolled again for the spring semester 2015 compared to about eight out of ten comparison students (81%) (Table 3.8). Based on logistic regression, the probability that an ACES student returned for spring semester retention was nearly three times the probability for comparison students (odds ratio =

2.98). The rate of retention was statistically ($p < .001$) and practically significant with a medium effect size (ES > 0.50), indicating that ACES participants were significantly more likely to return for spring semester than nonparticipants.

Table 3.8
Relationship Between Participation in ACES and Spring Semester Retention and Receipt of Financial Aid in 2014–2015

	Descriptive statistics by group						Logistic regression results			
	ACES			Comparison			B		Odds	Effect
Outcome measure	N	n	%	N	n	%	(SE)	Wald	ratio	size (ES)
Returned for spring semester 2015[a]	300	277	92.3	267	217	81.3	1.09 (0.28)	15.53***	2.98	0.60
Receipt of financial aid	325	266	81.5	325	194	59.7	1.19 (0.20)	37.19***	3.28	0.66

Note. SE = standard error.
[a]Limited to students who first enrolled in summer session I 2014; summer session II 2014; or fall semester 2014.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Receipt of Financial Aid

More than eight out of ten ACES students received financial aid, while only six out of ten comparison students did so (Table 3.8 above). The likelihood of receiving financial aid was significantly higher for ACES students (odds ratio = 3.28, $p < .001$) with a medium effect size (ES > 0.50).

Summary for Question 3

In summary, there were several differences in academic success between ACES students and a matched comparison group of nonparticipants. ACES students were more likely to enroll in any preparatory course and in developmental courses. Also, the pass rate was higher for developmental courses taken by ACES students than for those taken by comparison students.

The differences between ACES and comparison students with respect to college-credit courses were quite positive. ACES participants were more likely to enroll in college-credit courses and had a higher earned GPA in those courses than nonparticipants. Also, the pass rate for college-credit courses was higher among courses taken by ACES students than for those taken by comparison students. Further, ACES students made more academic progress than the comparison students: they were more likely to return for spring semester and earned more college credits. Lastly, ACES students were more likely to receive financial aid than comparison students. The largest impacts, based on effect sizes, were for spring semester retention and receipt of financial aid.

Conclusion

In conclusion, there were many positive outcomes for the first group of ACES students who enrolled at MC. Almost all these students enrolled in at least one college-credit course and were largely successful. ACES students had a mean GPA in their college-credit courses of 2.42 and earned passing grades in more than five out of six college-credit courses. Spring retention was very high. More than eight out of ten of ACES students received financial aid. Further, ACES students significantly out-performed a matched, comparison group of students on several measures: enrollment in college credit courses, mean GPA, passing rate for college-credit courses, spring retention, and receipt of financial aid. Based on effect sizes from comparisons between ACES students and the non-ACES group, the largest impacts of the program were on receipt of financial aid and spring semester retention.

Although there were many positive outcomes, five out of six ACES students (86%) enrolled in at least one preparatory course and were more likely to do so than the comparison students (78%). Students are directed to preparatory classes at MC because they have not demonstrated college-readiness on standardized tests such as the ACT, SAT, or ACCUPLACER. The high enrollment rate in preparatory courses is an area of concern, because these courses do not earn college credits but cost students money, delay the time to graduation, and may discourage students from staying in college. On a more positive note, the pass rate for developmental courses taken by ACES students was higher than that for developmental courses taken by comparison students. One measure of success for ACES students who enroll at MC is graduation with an associate's degree that requires approximately 60 college credits. On average, ACES students earned one fifth of that goal (12 credits) in their first year at MC, although they did earn significantly more credits than the comparison students who averaged only 9 credits in their first year at MC. Lastly, ACES students who received special education services as high school seniors had lower levels of success than other ACES students who received services in high school in multiple areas: achievement in developmental courses, achievement in college-credit courses, and academic progress.

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Appendix

Table A1
Characteristics of Matched ACES Students and Comparison Students

	Matched ACES[a] (*N* = 325)		Comparison (*N* = 325)	
Characteristics	*n*	%	*n*	%
Gender				
Female	181	55.7	164	50.5
Male	144	44.3	161	49.5
Race/Ethnicity				
Asian	31	9.5	31	9.5
Black or African American	107	32.9	99	30.5
Hispanic/Latino	160	49.2	160	49.2
White	21	6.5	29	8.9
Two or More Races	6	1.8	6	1.8
Services received in high school as of 09/13				
Current FARMS	184	56.6	183	56.3
Current special education	43	13.2	35	10.8
Current ESOL	31	9.5	31	9.5
Prior ESOL	42	12.9	42	12.9
Other				
First generation to go to college[b]	167	52.5	--	--

[a]Excludes four ACES students who did not have a match.
[b]Information on first generation status was not available for comparison students.