Tracking 2003 ACT®-Tested High School Graduates: College Readiness, Enrollment, and Long-Term Success

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Abstract

This study examined the relationships between multiple measures of college readiness and success in college. Outcomes included enrollment in college immediately after high school, retention in college, and degree completion. College readiness indicators at time of high school graduation included ACT[®] scores and Benchmark attainment, high school coursework taken, and grade point average. College success was also evaluated by early readiness indicators, individually and in combination, from grade 8 through grade 11/12.

The primary data sources for the study consisted of all ACT-tested 2003 high school graduates (for enrollment) and a stratified random sample of 24,850 of these high school graduates who immediately enrolled in college in fall 2003 (for retention and degree completion). Over 5,000 of the enrolled students had also participated in EXPLORE[®] and PLAN[®]. Results were disaggregated by institution type.

The results of this study demonstrate the importance of college readiness for enrollment in college and for persistence to timely degree completion. This study also documents the benefits of a longitudinal assessment system for monitoring students' readiness early and often. A longitudinal system provides an infrastructure to intervene and better prepare students for college and career, before they graduate from high school.

Acknowledgments

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Introduction

Students must be prepared to compete in today's highly technology-based economy, where many well-paying jobs now being created require at least some postsecondary education training, or the skills and knowledge equivalent to those expected of first-year college students. Most students aspire to at least some college study, but discrepancies exist between their educational aspirations and the coursework they complete in high school. In 2007-08, over one-third of all college freshmen had entered college underprepared and needed to take at least one remedial course (Aud, Hussar, Kena, Bianco, Frohlich, Kemp, & Tahan, 2011). Because remedial courses are typically not credit-bearing courses, taking remedial coursework delays completing education programs. In fact, according to Adelman (2004), 70% of students who take one or more remedial reading courses fail to earn a college degree or certificate within eight years of enrolling.

As a result, states, districts, and schools are increasingly implementing policies to help improve the college and career readiness of their high school graduates. Forty-five states have formally adopted the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2011). Some states, districts, and schools have implemented additional college readiness assessments, such as those that comprise ACT's longitudinal assessment system, to monitor early and often student's progress towards becoming college and career ready and to increase their awareness of, preparation for, and access to higher education (ACT, 2009a).

Tests from ACT's longitudinal assessment system include EXPLORE (taken in grade 8 or 9), PLAN (taken in grade 10), and the ACT (taken in grade 11 or 12) that measure educational

achievement in four content areas (English, mathematics, reading, and science). All three tests are supported by ACT's College Readiness Standards and share a common score scale. Each test also has its own set of College Readiness Benchmarks, allowing student progress toward college and career readiness to be tracked across time. The ACT College Readiness Benchmarks are the minimum ACT test scores required for students to have a high probability of success in first-year, credit-bearing college courses—English Composition, College Algebra, social sciences courses, and Biology (Allen & Sconing, 2005).

Historically, numerous research studies have consistently demonstrated that college readiness indicators, such as ACT scores, mathematics and science coursework taken in high school, and high school grade point average (GPA), predict both early college success, as measured by first-year college GPA, and first-to-second year retention (ACT, 2010a; Allen, Robbins, Casillas, & Oh, 2008; Noble & Radunzel, 2007; Noble & Sawyer, 2002; Robbins, Allen, Casillas, Peterson, & Le, 2006). In particular, ACT has found that students who meet the ACT College Readiness Benchmarks are more likely to

- enroll in college the fall following high school graduation;

- persist to the second year at the same institution;

- achieve a grade of B or higher in first-year college courses; and

- achieve a 2.0 or higher, or 3.0 or higher, first-year college GPA (ACT, 2010a).

In addition, students who meet the English Benchmark are less likely to take remedial English, and students who meet the Mathematics Benchmark are less likely to take remedial mathematics.

More recent studies have examined relationships between college readiness and long-term college outcomes, including degree completion. One such study, conducted by Noble & Radunzel (2007), found that students who met the ACT College Readiness Benchmarks had

higher college success rates over time, including degree completion rates, than students who did not meet the Benchmarks. The study also found higher college success rates for students with higher high school GPAs (compared to those with lower GPAs) and students who had taken higher-level high school mathematics or science coursework (compared to those not taking higher-level courses).

Unfortunately, gaps exist in college success rates across racial/ethnic and family income groups. College enrollment rates have been found to be higher for Asian American and White students, than for African American, American Indian, and Hispanic students (ACT, 2010a). Higher college enrollment rates have also been found for higher-income students than for lower-income students (Aud et al., 2011). And, of students who enroll in college, substantial numbers do not persist to a college degree, especially students from underrepresented racial/ethnic minority groups and those from families with lower annual incomes (ACT, 2010a; Snyder & Dillow, 2011). However, multiple studies (ACT, 2010a; Noble & Radunzel, 2007; Adelman, 2006; Cabrera, Burkum, & La Nasa, 2005) have demonstrated that these gaps in college enrollment, retention, and degree completion rates narrow substantially among students who are academically prepared and ready for postsecondary education.

In the past, most ACT studies on these topics were based on convenience samples of data from institutions or states that participated in various ACT research services or partnerships. Based on the available data sources, these studies focused primarily on degree completion from the institutions in which students initially enrolled. In this study, we extend our previous research by examining these relationships for a nationally representative sample of ACT-tested high school graduates. We also track degree completion from any institution, so that degrees earned by transfer students are also counted. Moreover, we examine the use of early college readiness

indicators for predicting college success. College outcomes for this study include immediate college enrollment after high school graduation and college retention and degree completion over time. In particular, in this study we investigate

- the importance of college readiness for college success;

- the extent to which college readiness helps reduce gaps in college success rates across racial/ethnic groups and family income ranges;

- the benefits of participating in an early monitoring system, such as ACT's longitudinal assessment system, on college success rates;

- the utility of early readiness indicators (in grades 8 and 10) for predicting college success; and

- the implications of early and sustained college readiness for increasing students' chances of persisting to degree completion.

Data

College Enrollment

Data to examine college enrollment included 1,102,539 ACT-tested 2003 high school graduates nationally.[1] Seven percent of ACT-tested 2003 high school graduates had participated in all three components of ACT's longitudinal assessment system (referred to in this report as EPA-tested students), while 39% of the students had participated in both PLAN and the ACT (referred to as PA-tested students; Table 1). By design, EPA-tested students included in this study took EXPLORE in grade 8 (77% in fall 1998; 23% in spring/summer 1999) and PLAN in

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[1] Because we statistically controlled for high school attended in the college enrollment analyses, students must have provided a valid code for the high school attended from one of the fifty U.S. states or the District of Columbia.

grade 10 (99.6% in fall 2000; 0.4% in spring 2001).[2] Enrollment information was obtained from the National Student Clearinghouse (NSC). Immediate enrollment was defined as enrolling in college the fall following high school graduation (i.e., fall 2003).

Table 1

EPA Participation Group Sample Sizes by College Outcome

EPA participation group	Enrollment No. (Pct.)	Retention and degree completion No. (Pct.)
EXPLORE/PLAN/ACT (EPA)	80,988 (7%)	5,276 (21%)
PLAN/ACT (PA), no EXPLORE	345,970 (31%)	8,438 (34%)
ACT only	675,581 (61%)	11,136 (45%)

Note. Enrollment analyses based on entire cohort of ACT-tested 2003 high school graduates and retention and degree completion analyses based on a random sample of those who immediately enrolled in college. No. = number; Pct. = percent.

College Retention over Time and Degree Completion

Data used to examine college retention over time and degree completion included 24,850 ACT-tested 2003 high school graduates who enrolled in college in fall 2003. This group of students comprised a stratified random sample of all ACT-tested 2003 high school students who enrolled in college the fall following high school graduation and who had provided their gender, race/ethnicity, and family income range. Students who had taken EXPLORE or PLAN under extended time were not included in the sampling frame.

We focused on students who enrolled in college immediately after high school; they constitute the majority of incoming freshmen (U.S. Department of Education, 2002). Some researchers suggest that it may not be appropriate to combine results for delayed enrollees and

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[2] A majority of 1998-1999 EXPLORE-tested students nationally tested in grade 8 and 2000-2001 PLAN-tested students nationally tested in grade 10 (90% and 92%, respectively). Only 2% of 1998-1999 EXPLORE-tested students tested in grade 9, while the remaining 8% tested in earlier grades primarily for talent search purposes. Only 3% of 2000-2001 PLAN-tested students tested in grade 11, 4% in grade 9, and the remaining 1% in other grades.

results for those who enroll in college immediately after high school, due to achievement, demographic, and college outcome differences between these students, as well as numerous possible reasons for students delaying or immediately enrolling into college (Horn, Cataldi, & Sikora, 2005). Of ACT-tested 2003 high school graduates nationally, 7% delayed college enrollment until the fall of 2004.

For this study, we oversampled EPA-tested and PA-tested only students, as well as African American and Hispanic students to ensure sufficient sample sizes to address the study objectives related to these groups of students. Oversampling of racial/ethnic minority groups depended on EPA participation group and Benchmark attainment. Twenty-one percent of the students in this sample were EPA-tested students, while 55% were PA-tested students (Table 1). We obtained follow-up data on all students in the sample through fall 2010 from the NSC.

For retention and degree completion, weighted analyses were used to account for the oversampling of certain student groups and to ensure that the results would be representative of those for the entire population. The weights were calculated as the proportion in the population divided by the proportion in the sample (Table 2). Because analyses were conducted separately by institution type, as well as for EPA- and PA-tested students, the weights used in the analyses were normalized so that the sum of the weights would equal the number of students included in the analyses.

Table 2

Weights for Random Sample of ACT-Tested 2003 High School Graduates who Immediately Enrolled in College

EPA group	Race/ethnicity	Sample (*n* = 24,850)		Population (*N* = 595,088)		Weights	
		Met all 4	Did not meet all 4	Met all 4	Did not meet all 4	Met all 4	Did not meet all 4
ACT-tested only	African American	58	1,489	1,318	41,118	0.95	1.15
	Hispanic	104	746	2,222	21,301	0.89	1.19
	All other	8,739		283,958		1.36	
PA-tested only	African American	59	777	828	15,911	0.59	0.86
	Hispanic	90	407	1,205	7,346	0.56	0.75
	All other	7,105		174,615		1.03	
EPA-tested	African American	35	471	190	3,222	0.23	0.29
	Hispanic	51	201	281	1,413	0.23	0.29
	All other	4,518		40,160		0.37	

Note. Sampling for African American and Hispanic students was stratified by EPA participation and by whether all four of the ACT Benchmarks were met. Sampling for all other racial/ethnic groups was stratified by EPA participation only. PA = PLAN/ACT; EPA = EXPLORE/PLAN/ACT.

Analyses were done separately by institution type, where type was determined at time of initial enrollment.[3] Seventy-six percent of the students in the sample enrolled in a four-year institution in fall 2003 (18,860 four-year students from 1,119 four-year institutions; 5,990 two-year students from 603 two-year institutions). This four-year enrollment rate was consistent with that seen for students from the entire ACT-tested 2003 graduating class who immediately enrolled in college the fall following high school graduation.

Compared to two-year institutions, a higher percentage of four-year institutions were private institutions and were from the Eastern region of the U.S. (Table 3). The vast majority of

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[3] For students enrolled in multiple institutions during their first term, only one institution was included in the analyses. The selection of the institution was based on the institution from which the highest degree was earned and the greatest number of fall terms enrolled at the institution. In the sample, less than 1% of the students were initially enrolled in more than one institution (150 students enrolled at both a 2- and 4-year institution, 63 students enrolled at two 4-year institutions, and 26 students enrolled at two 2-year institutions).

two-year institutions had open admissions policies (93%), while only 6% of four-year institutions had such policies.

Table 3

Description of Institutions in Sample

Institution characteristic	Category	Four-year institutions ($N = 1,119$)		Two-year institutions ($N = 603$)	
		n	Pct.	n	Pct.
Admissions selectivity	Highly selective	113	10	0	0
	Selective	321	29	0	0
	Traditional	479	43	9	1
	Liberal	54	5	9	2
	Open	70	6	558	93
Affiliation	Private	650	58	23	4
	Public	467	42	573	95
Region	East	521	47	194	32
	Midwest	286	26	175	29
	Southwest	110	10	71	12
	West	200	18	156	26

Note. Percentages may not sum to 100 due to rounding or missing data. The admission policies of the institutions in this study were classified according to the high school class ranks of their accepted freshmen: the majority of freshmen at highly selective schools are in the top 10%, selective in the top 25%, traditional in the top 50%, liberal in the top 75% of their high school class. Institutions with open admissions policies accept all high school graduates to limit of capacity. Pct. = percent.

Retention was evaluated two ways: fall to subsequent fall enrollment at the same institution and at any institution, requiring students to be continuously enrolled across fall terms up to the term of interest. Students who completed a degree and were continuously enrolled in years prior to degree completion were considered to be continuously enrolled in the years following degree completion.

For degree completion, we evaluated time to bachelor's degree from any institution for students who initially enrolled in a four-year institution (referred to as four-year students in this report) and time to an associate's degree for students who initially enrolled in a two-year institution (referred to as two-year students), both through Year 6. For two-year students, we also

examined time to an associate's or bachelor's degree to account for students who transferred from a two- to a four-year institution without having earned an associate's degree.[4] Otherwise, transfer students were treated the same as other students in this study (i.e., all students were categorized according to the type of institution in which they initially enrolled). Time to degree completion was calculated in months by subtracting the degree completion date from the initial college enrollment date divided by 30.5 days.

College Readiness Indicators and Student Demographics

Data for the college readiness indicators and student demographics were obtained primarily from the ACT student record. If students took the ACT more than once, only the most recent ACT record was used. College readiness indicators included

- meeting/exceeding the ACT College Readiness Benchmarks in English, Mathematics, Reading, or Science;

- number of ACT Benchmarks met;

- ACT Composite score;

- taking a core curriculum in high school;[5]

- high school mathematics coursework taken (beyond Algebra I, Geometry, and Algebra II; Algebra I, Geometry, and Algebra II; or less than Algebra I, Geometry, and Algebra II);

- high school science coursework taken (Biology only; Biology and Chemistry; or Biology, Chemistry, and Physics); and

- high school GPA (HSGPA of 3.50 or higher; 3.00 to 3.49; less than 3.00).[6]

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[4] We did not evaluate associate's degree completion rates for students who transferred from a four- to a two-year institution. However, the percentage of four-year students who earned an associate's degree in six years was relatively small (5%).

[5] The core curriculum, as described in *A Nation at Risk* (National Commission on Excellence in Eduation, 1983), includes at least 4 years of English and at least 3 years each of mathematics, social studies, and natural sciences (4-3-3-3).

For EPA-tested students, the college readiness indicators examined included: meeting/exceeding the EXPLORE and PLAN College Readiness Benchmarks (by subject area and by number met; individually and in combination labeled as combined EXPLORE/PLAN Benchmark attainment), EXPLORE and PLAN Composite scores, and combined EXPLORE/PLAN/ACT Benchmark attainment. Similarly, for all PA-tested students (irrespective of whether student had participated in EXPLORE), we also included meeting/exceeding the PLAN College Readiness Benchmarks, PLAN Composite scores, and combined PLAN/ACT Benchmark attainment. Results for PA-tested students were in general agreement with the results for EPA-tested students. We therefore only present results for EPA-tested students in this report.

Scores range from 1 to 25 for EXPLORE, 1 to 32 for PLAN, and 1 to 36 for the ACT. The Composite score is the rounded arithmetic average of the four subject area scores. The ACT College Readiness Benchmarks correspond to scores of 18, 22, 21, and 24 on the ACT English, Mathematics, Reading, and Science tests, respectively. Students who meet the Benchmark have approximately a 50% chance of earning a B or better and approximately a 75% chance of earning a C or better in the corresponding college course or courses (ACT, 2010b). In addition to the Benchmarks for the ACT test, there are corresponding EXPLORE and PLAN Benchmarks (Table 4) for use by students who take these programs in the eighth and tenth grades, respectively, to gauge their progress in becoming ready for college (ACT, 2010b).

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[6] The categories used for HSGPA were approximately based on the tertiles of the distribution for all ACT-tested 2003 high school graduates.

Table 4

EXPLORE, PLAN, and ACT College Readiness Benchmarks

College course or course area	Test	EXPLORE grade 8	PLAN grade 10	ACT
English Composition	English	13	15	18
College Algebra	Mathematics	17	19	22
Social sciences	Reading	15	17	21
Biology	Science	20	21	24

High school coursework and GPAs were based on students' self-reports of their coursework taken in 23 specific courses in English, mathematics, social studies, and science and the grades earned in these courses.

Student demographic characteristics included

- gender;

- race/ethnicity (African American, Asian, Hispanic, White, and Other/Multiracial);[7] and

- family income range (less than $30,000, $30,000 to $60,000, and more than $60,000).

Where racial/ethnic comparisons involved smaller numbers of students, we compared underrepresented minority students to White students. Underrepresented minority students included African American, American Indian, and Hispanic students.

Method

For the college enrollment analyses, we estimated hierarchical logistic models that accounted for high school attended. Weighted hierarchical logistic models were estimated to predict retention and degree completion. These latter models accounted for initial postsecondary institution attended. Hierarchical models account for students clustered within high schools or postsecondary institutions. In all cases, we estimated random intercept models (in which the

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[7] American Indian/Alaskan Native students were included in the analyses. However, due to the small number of these students, individual results for this group are not reported.

intercepts, but not the slopes, were allowed to vary across institutions).[8] Separate models were developed for each type of institution (2- or 4-year institutions) by year for retention (years 2 to 4) and degree completion (years 4 to 6). Hierarchical logistic models were run in SAS 9.2 using the GLIMMIX procedure. The estimated college success rates from these models can be interpreted as the typical rates across high schools (for enrollment) or typical rates across two- or four-year institutions (for retention and degree completion).

To estimate college success rates by college readiness indicators, models included one or more college readiness indicators as predictors.[9] For example, one-predictor models were used to estimate college success rates for individual college readiness indicators using the fixed effects parameter estimates. Three-predictor models were developed for EPA-tested students to estimate college success rates by combined EXPLORE/PLAN/ACT Benchmark attainment. College success rates by individual subject Benchmark attainment were estimated by including test scores in the models as continuous predictors and then calculating a weighted average of college success rates across students by whether or not the Benchmark was met. This estimation approach was also used for Composite scores, the number of Benchmarks met, and HSGPA. Models were not only developed for the overall sample of students, but also by gender, race/ethnicity, and family income range by including the student demographic characteristic as predictor(s) in the models. Interaction terms between the college readiness indicators and student demographic characteristics were examined, but these interactions were generally not found to be statistically significant at the 0.01 significance level.

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[8] In prior research based on retention and degree completion data that included complete freshman cohorts for the institutions, we found that the slopes for the college readiness indicators also varied across institutions. In this study the variability in the intercepts was significantly different from zero, but this was not the case for the slopes. This result is likely partially explained by the smaller institutional sample sizes in this study (based on a stratified random sample of immediately enrolled ACT-tested graduates and not complete freshman cohorts for the institutions). For consistency, random intercept models were also used for college enrollment.

[9] In this study, we did not evaluate complex models. The primary goal of this study was to estimate college success rates by individual college readiness indicators.

Some students did not respond to high school coursework and grade items, as well as to the family income range item, when they completed the ACT registration materials. Multiple imputation was used to estimate missing values for the entire ACT-tested 2003 graduating class; 17% of students had missing HSGPA and 22% of students had missing family income range. Corresponding missing percentages for the random sample of enrolled students were 8% for HSGPA and 0% for family income range (based on sampling frame used for the latter). Five data sets were imputed. For a few predictors, models were developed for all five imputed data sets; no differences of practical significance in average estimated success rates were found across the data sets. The results reported here are therefore those based only on the initial imputed data set.

One limitation to the NSC degree data was that for about 1,800 students only the degree date and the awarding institution were provided, and not the actual type of degree that was earned.[10] Rather than excluding these students from the analyses, we implied the type of degree based on the following information: type of awarding institution, status of whether a prior, less advanced degree was earned, and the time to degree completion from the initial college start date.[11] The typical total enrolled time (adjusted and unadjusted for level of enrollment) and typical time to degree completion (including and excluding summer terms) were comparable between students with known degrees and those with implied degrees.

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[10] There were ~1,200 students with an unknown degree type from a four-year institution without a bachelor's or graduate degree (such as a master's degree) and ~600 students with an unknown degree type from a two-year institution without an associate's degree. There were other students with bachelor's or associate's degrees who also had unknown degrees, but in these cases the unknown degrees were ignored. It was not uncommon in these cases for the known and unknown degree dates to be similar.

[11] For students who had not earned any prior, less advanced degrees, unknown degrees from four-year institutions were classified as a bachelor's degree if the degree was earned in 44 or more months, associate's degree if the degree was earned in 24 to 44 months, or a certificate degree if the degree was earned in less than 24 months. Unknown degrees from two-year institutions were classified as one of the latter two degree types using the same time frames as those used for the unknown four-year degrees.

Results

Description of Study Samples

Tables 5 and 6 contain descriptive statistics on the student demographic characteristics and college readiness indicators, respectively, for the overall sample of 2003 high school graduates, as well as weighted statistics for the random sample of immediately enrolled students disaggregated by institution type. The student demographic and college readiness percentages for the students included in the college enrollment analyses in this study were comparable to those previously reported for the entire ACT-tested 2003 high school graduating class (ACT, 2003). Only about one in five of the students (21%) met all four of the ACT Benchmarks.

Table 5

Description of Student Demographics by Study Samples

Student demographic characteristic	Level/value	2003 HS graduates (*N* = 1,102,539)		Four-year students (*N* = 18,860)		Two-year students (*N* = 5,990)	
		n	Pct.	*n*	Wgt. Pct.	*n*	Wgt. Pct.
Race/ethnicity	Underrepresented Minority	205,889	19	3,556	18	1,176	19
	African American	121,121	11	2,189	10	700	11
	Hispanic	73,234	7	1,196	6	403	6
	White	776,149	70	14,135	77	4,464	75
	Asian	37,435	3	667	4	155	3
Gender	Male	479,583	43	7,977	42	2,712	45
	Female	617,805	56	10,883	58	3,278	55
Family income	< $30,000	257,030	23	3,632	19	1,664	28
	$30,000-$60,000	389,772	35	6,450	34	2,469	41
	> $60,000	455,737	41	8,778	47	1,857	31

Note. For the two- and four-year student samples, the percentages reported are weighted percentages. Underrepresented minority students included African American, American Indian, and Hispanic students. Percentages may not sum to 100 due to rounding, missing data, or categories that were not used in this study. The sample of ACT-tested 2003 high school graduates included in the college enrollment analyses included only students who provided a valid high school code from one of the fifty U.S. states or the District of Columbia. HS = high school; Wgt. = weighted; Pct. = percent.

Table 6

Description of College Readiness Indicators by Study Samples

College readiness indicator	Level/value	2003 HS graduates (*N* = 1,102,539)		Four-year students (*N* = 18,860)		Two-year students (*N* = 5,990)	
		n	Pct.	*n*	Wgt. Pct.	*n*	Wgt. Pct.
ACT English Benchmark	Not met	353,689	32	3,537	19	2,754	47
	Met	748,850	68	15,323	81	3,236	53
ACT Mathematics Benchmark	Not met	658,285	60	8,956	47	4,647	78
	Met	444,254	40	9,904	53	1,343	22
ACT Reading Benchmark	Not met	527,084	48	6,907	37	3,815	64
	Met	575,455	52	11,953	63	2,175	36
ACT Science Benchmark	Not met	813,705	74	12,065	65	5,213	87
	Met	288,834	26	6,795	35	777	13
Number of ACT Benchmarks met	0	290,126	26	2,647	14	2,328	40
	1	194,413	18	3,094	16	1,353	22
	2	218,525	20	3,994	21	1,222	20
	3	171,970	16	3,607	19	614	10
	All 4	227,505	21	5,518	29	473	8
ACT Composite score range	1 to 18	373,399	34	3,760	20	2,970	50
	19 to 21	253,019	23	4,389	24	1,583	26
	22 to 24	215,447	20	4,429	23	923	15
	25 to 27	148,874	14	3,557	19	407	6
	28 to 36	111,800	10	2,725	14	107	2
Core curriculum	Noncore	408,879	37	5,162	28	2,751	47
	Core	693,660	63	13,698	72	3,239	53
HS math course sequence	< Alg I, Geom, Alg II	160,567	15	1,310	7	1,219	21
	Alg I, Geom, Alg II	376,423	34	5,876	32	2,631	44
	> Alg I, Geom, Alg II	511,525	46	10,919	57	1,879	30
HS science course sequence	Bio	216,067	20	2,315	12	1,695	27
	Bio & Chem	530,669	48	9,694	52	2,876	48
	Bio, Chem, & Phys	262,755	24	5,605	29	930	16
HSGPA	< 3.00	373,986	34	4,121	22	2,910	49
	3.00 to 3.49	319,084	29	5,430	29	1,754	30
	> = 3.50	409,469	37	9,309	49	1,326	22

Note. For the two- and four-year student samples, the percentages reported are weighted percentages. Percentages may not sum to 100 due to rounding, missing data, or categories that were not used in this study. HS = high school; Wgt. = weighted; Pct. = percent; HSGPA = high school grade point average; Alg = Algebra; Geom = Geometry; Bio = Biology; Chem = Chemistry; Phys = Physics.

In general, the immediately enrolled sample had similar student demographic and college readiness characteristics as those of students in the entire ACT-tested 2003 high school graduating class who immediately enrolled in college (percentages not shown). This finding also held true when disaggregated by institution type. The one characteristic that differed slightly between the sample and the population of immediately enrolled students was annual family income: Proportionately fewer higher-income students were sampled, but by only three percentage points for both four- and two-year students. Compared to undergraduate enrollment totals at two- and four-year postsecondary institutions (Knapp, Kelly-Reid, & Whitmore, 2006), the percentages of females in our weighted samples of enrolled students were within 1 percentage point for both institution types, but the percentages of underrepresented minority students in our samples were lower (by 4 percentage points for four-year institutions and by 11 percentage points for two-year institutions).[12]

Compared to two-year students, four-year students were more likely to meet the ACT College Readiness Benchmarks, to earn a higher ACT Composite score, to take a core curriculum, to take higher-level mathematics and science coursework in high school, and to earn a higher HSGPA (Table 6). In addition, four-year students were more likely to have a higher family income range and slightly more likely to be female (Table 5).

Across high schools, 68% of ACT-tested 2003 high school students typically enrolled in college the fall following high school graduation.[13] Table 7 provides a summary of the estimated

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[12] Results compared to total undergraduate enrollment in fall 2004 using data from the Integrated Postsecondary Education Data System (IPEDS). Similar enrollment total breakdowns by institution type were not readily available for fall 2003. For underrepresented minority percentages from IPEDS, we excluded students with unknown race/ethnicity and those classified as nonresident aliens. Our sample of two-year ACT-tested students is likely a more homogenous group of students than the IPEDS sample of undergraduate students attending two-year postsecondary institutions.

[13] Based on the random intercept models, the variability in the intercepts was significantly different from zero, which suggests that college enrollment rates varied across high schools.

retention and degree completion rates by year for both two- and four-year students, after accounting for variability across institutions.

Table 7

Estimated Retention and Degree Completion Rates by Year for Two- and Four-Year Students

College outcome	Four-year students	Two-year students
Retention to the same institution		
1st to 2nd year	77	61
1st to 3rd year	64	30
1st to 4th year	57	14
Retention to any institution		
1st to 2nd year	90	74
1st to 3rd year	82	56
1st to 4th year	75	44
Degree completion	Bachelor's degree	Associate's degree
Year 2	< 1	7
Year 3	1	15
Year 4	35	19
Year 5	55	23
Year 6	61	24

Note. Estimates were based on weighted hierarchical logistic models. Degree completion rates by year 7 were 65% for four-year students (bachelor's degree) and 26% for two-year students (associate's degree).

For both two- and four-year students, rates associated with retention to the same institution decreased at a faster rate over time than those associated with retention to any institution (Table 7). Two-year students had much lower retention and degree completion rates than four-year students. The typical rates for completing a bachelor's degree at a four-year institution increased from 35% by year 4 to 61% by year 6. Rates for completing an associate's degree were relatively low, with only 15% of two-year students completing an associate's degree by year 3 and about one in four completing an associate's degree by year 6 (24%). In comparison, the six-year rate for completing an associate's degree or a bachelor's degree for students initially enrolled in a two-year institution was 37%.

To further examine bachelor's degree completion, we also estimated the median time to bachelor's degree completion using Kaplan-Meier estimates (Kaplan & Meier, 1958). This method accounted for censored observations, namely those students who had not yet completed a degree by the end of the study period. The median time to bachelor's degree completion across students was 57 months.[14]

Due to the relative low retention rates to the same institution and early associate's degree completion rates (by year 3 or earlier) for two-year students, we focused primarily on retention to any institution over time and associate's degree completion by years 4, 5, and 6 for these students.

Gaps in College Success Rates by Student Demographics

The typical college success rates across institutions by student demographic characteristic and college readiness indicator are reported in Appendix A; a table is given for each college outcome. The college success rates reported in this section were estimated from models that included only the student demographic characteristic in the model; college readiness was not taken into account in these models.

Gender. Female students were slightly more likely than male students to enroll immediately into college the fall following high school graduation (69% vs. 66%), to remain enrolled at the same institution through year 4 (58% vs. 56% for four-year students and 16% vs. 13% for two-year students), to remain enrolled at any institution through year 4 (77% vs. 72% for four-year students and 46% vs. 41% for two-year students), and to complete an associate's degree by year 6 (27% vs. 21%). Female students were substantially more likely than male

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[14] The Kaplan-Meier method, however, did not account for students being clustered within postsecondary institutions as did the hierarchical logistic models. But, the median results from the Kaplan-Meier method and the percentages from the models were in agreement.

students to complete a bachelor's degree in a timely manner (40% vs. 27% by year 4 and 64% vs. 57% by year 6).

Race/ethnicity. Asian and White students had the highest college enrollment rates, while Hispanic students had the lowest college enrollment rates (ranging from 59% to 70%; Table A-1). At four-year institutions, first-to-second year retention rates to the same institution were somewhat comparable across racial/ethnic groups (within 4 percentage points for White, Hispanic, and African American students; Table A-2). However, by year 4, differences in retention rates among the racial/ethnic groups increased (to 6 percentage points for Hispanic students and 11 percentage points for African American students, compared to White students). For four-year students, racial/ethnic differences in retention rates to any college were slightly higher than those noted for retention to the same college (by 1 to 2 percentage points). At two-year institutions, Hispanic students had retention rates to any college through year 4 that were comparable to those for White and Asian students and higher retention rates to the same college than those for White students (Tables A-2 and A-3). African American students at two-year institutions had the lowest retention rates to any institution (30% vs. 46% for White students at year 4).

For students who immediately enrolled at four-year institutions, bachelor's degree completion rates were higher for White students and Asian students than for Hispanic students and African American students (by 10 to 11 percentage points for Hispanic students and 18 to 19 percentage points for African American students by year 6; Figure 1 and Table A-4). For those who initially enrolled at two-year institutions, associate's degree completion rates were higher for White students than for the other racial/ethnic groups (by 5 to 11 percentage points by year

6). This latter finding was also seen for the percentages of two-year students completing an associate's or bachelor's degree (by 7 to 20 percentage points by year 6).
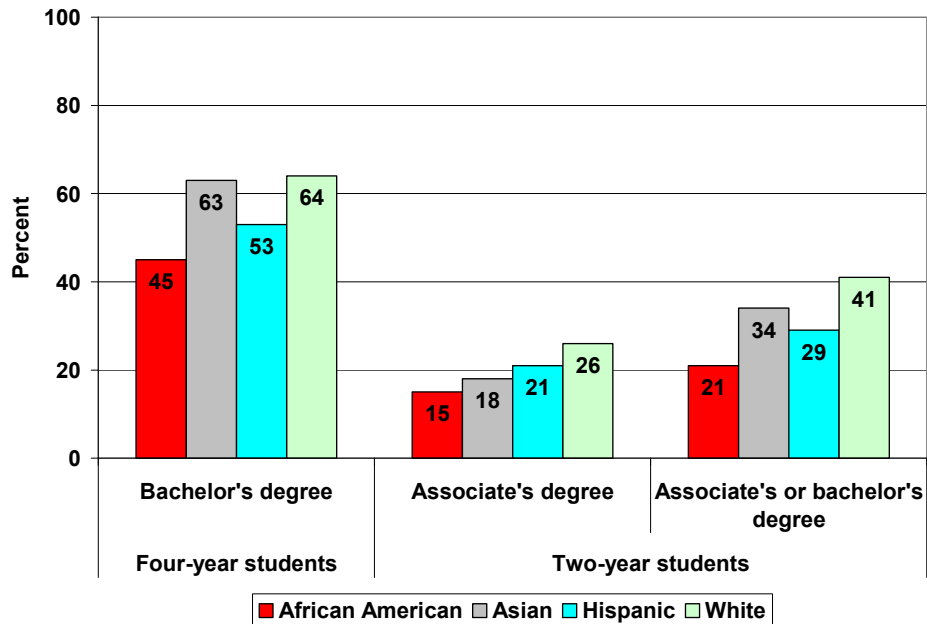
Figure 1. Six-year degree completion rates by race/ethnicity.

Family income range. Higher-income students were more likely than lower-income students to enroll immediately in college in fall 2003 (74% vs. 60%), to remain enrolled at the same institution through year 4 for four-year students (62% vs. 49%), to remain enrolled at any institution through year 4 (81% vs. 65% for four-year students and 51% vs. 36% for two-year students), and to complete a bachelor's degree by year 6 for four-year students (69% vs. 49%). Gaps in retention rates across family income groups generally increased over time. This finding is illustrated in Figure 2 for four-year students.
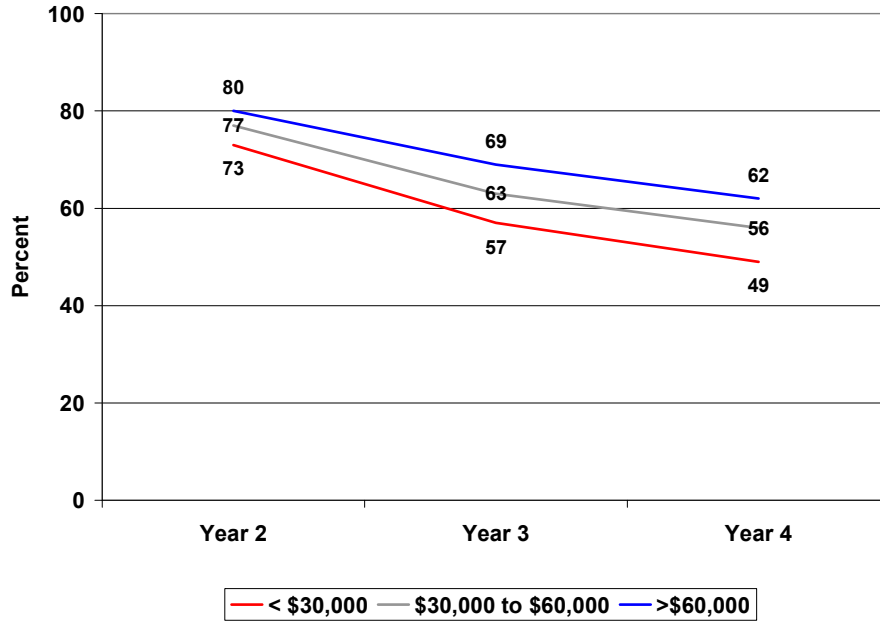
Figure 2. Retention rates to the same institution by family income range for four-year students.

Six-year associate's degree completion rates were only slightly higher for higher-income students than for lower-income students (26% vs. 20%). However, at two-year institutions, higher-income students were substantially more likely than lower-income students to complete an associate's or bachelor's degree by year 6 (44% vs. 29%).

The Importance of College Readiness for College Success

In this section, we demonstrate the importance of college readiness for college success by examining college success rates by individual college readiness indicators (see Appendix A for typical rates across institutions). We also examine college success rates disaggregated by mathematics or science high school coursework taken and ACT Benchmark attainment in the corresponding subject area.

ACT College Readiness Benchmarks. As the number of Benchmarks met increased, estimated success rates generally increased.[15] In particular, students who met all four of the ACT College Readiness Benchmarks were more likely than students who did not meet any of the Benchmarks to

- enroll immediately in college the fall following high school graduation (by 25 percentage points (79% vs. 54%); Table A-1);

- remain enrolled at the same institution for four-year students (by 16 percentage points at year 2 (84% vs. 68%) and 26 percentage points at year 4 (69% vs. 43%); Table A-2);

- remain enrolled at any institution for two-year students (by 13 percentage points at year 2 (83% vs. 70%) and 21 percentage points at year 4 (59% vs. 38%); Table A-3);

- earn a bachelor's degree by years 4, 5, and 6 for four-year students (by 31 to 34 percentage points (75% vs. 44% by year 6); Table A-4);

- earn an associate's degree by years 4, 5, and 6 for two-year students (by 12 to 13 percentage points (33% vs. 21% by year 6); Table A-4); and

- earn an associate's or bachelor's degree for two-year students by year 6 (by 28 percentage points; (57% vs. 29%); data not shown in tables).

Moreover, students who met all four of the Benchmarks earned a bachelor's degree in a more timely manner than students who met none of the Benchmarks (time to degree completion, medians were 47 months vs. more than 84 months, respectively).[16]

When typical success rates across institutions were examined by individual Benchmark attainment, we found that success rates were generally higher for students who met the

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[15] The one exception was retention to the same institution for two-year students at years 3 and 4.
[16] An actual median cannot be calculated for students who met none of the Benchmarks because only 47% of these students earned a bachelor's degree by the end of year 7.

Benchmark than for students who did not meet the Benchmark (Tables A-1 to A-4).[17] This finding is illustrated in Figure 3 for the percentage of two-year students earning an associate's or bachelor's degree by year 6. Across outcomes, the largest differences in success rates were generally seen between students meeting and those not meeting the Benchmark in mathematics or English. Differences in retention rates by individual ACT Benchmark attainment and by the number of Benchmarks met generally increased over time.
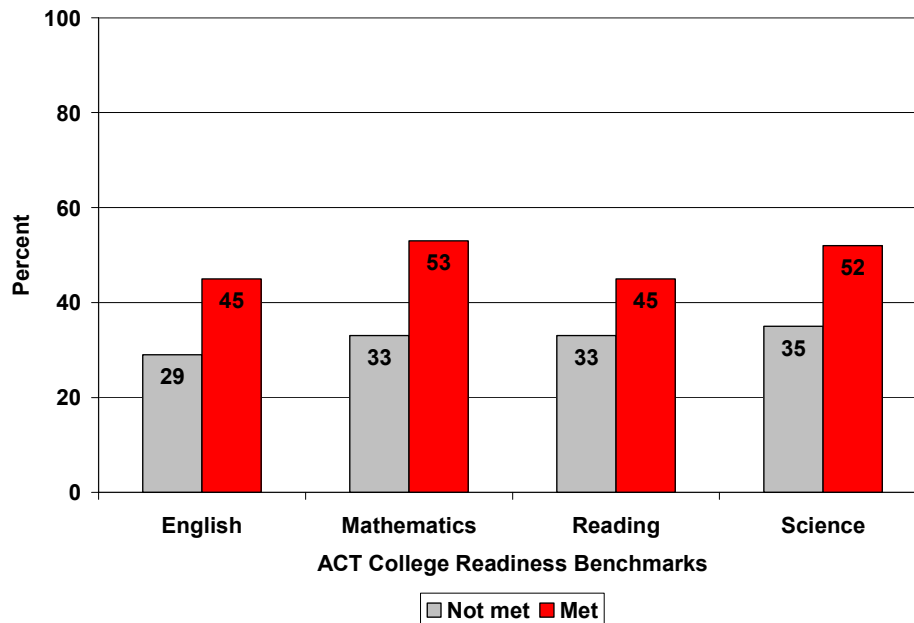
Figure 3. Six-year associate's or bachelor's degree completion rates by ACT Benchmark attainment for two-year students.

ACT Composite score. As ACT Composite score increased, estimated success rates increased for all the outcomes included in this study. This finding is illustrated across ACT Composite scores for six-year degree completion rates (Figure 4) and for retention rates over time for four-year students (Figure 5).

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[17] The exception was for retention to the same institution for two-year students at years 3 and 4.

Figure 4. Six-year degree completion rates by ACT Composite score for two- and four-year students. Table A-5 in Appendix A contains the relevant estimated regression coefficients from the degree completion models shown here.
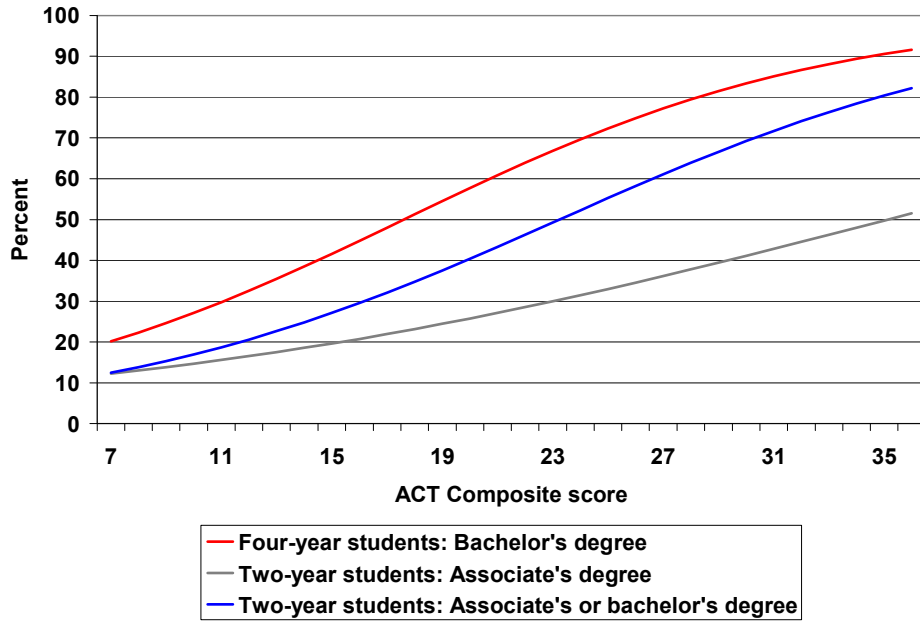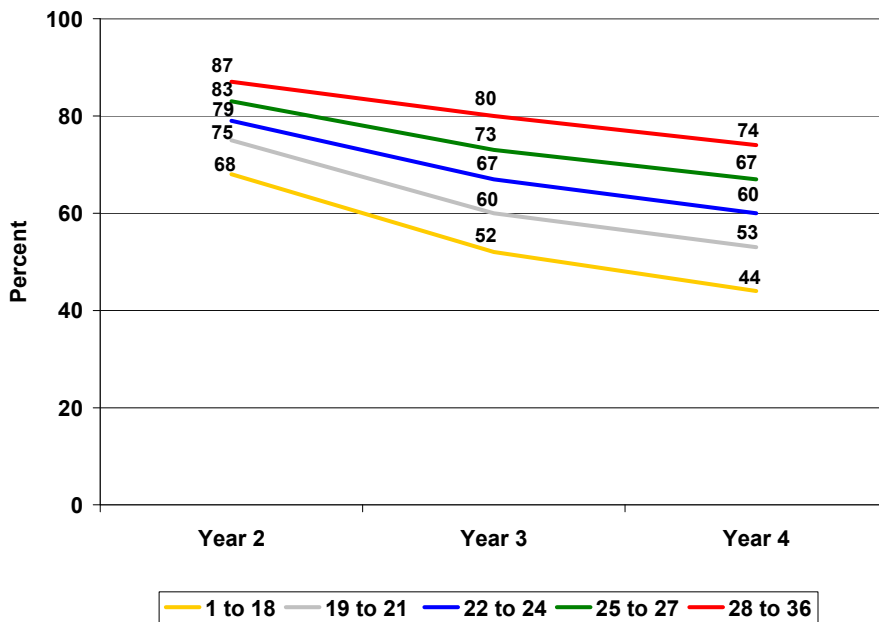

Figure 5. Retention rates to the same institution by ACT Composite score range for four-year students.

Students with a Composite score of 28 or higher had over a 60% chance of earning a bachelor's degree by year 4, while students with a Composite score of 18 or lower had less than a 50% chance of earning a bachelor's degree by year 6 (44%; Table A-4). The median time to bachelor's degree completion for four-year students with a Composite score of 28 or higher was 45 months. In comparison, the median time was more than 84 months for students with a Composite score of 18 or lower.[18] Moreover, the decline in retention rates from year 2 to year 4 was larger for students with lower ACT Composite scores. For instance, students with Composite scores of 18 or lower had only about a 50% chance or lower of persisting to the same four-year institution beyond year 2 (Figure 5).

High school coursework and high school GPA. College enrollment, retention, and degree completion rates were higher for students who had

- taken a core curriculum in high school compared to those who had not (by, at most, a maximum of 12 percentage points across the outcomes);

- taken high school mathematics coursework beyond Algebra I, Geometry, and Algebra II, compared to those who had taken Algebra I, Geometry, and Algebra II (by, at most, 12 percentage points) or those who had taken less than these three courses (by, at most, 25 percentage points);

- taken high school Biology, Chemistry, and Physics compared to those who had taken Biology and Chemistry only (by, at most, 6 percentage points) or those who had taken Biology only (by, at most, 19 percentage points); and

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[18] An actual median cannot be calculated for students with an ACT Composite score of 18 or lower because only 47% of these students earned a bachelor's degree by the end of year 7.

- earned a HSGPA of 3.50 or higher compared to those who earned a HSGPA between 3.00 to 3.49 (by, at most, 19 percentage points) or those who earned a HSGPA below 3.0 (by, at most, 37 percentage points).

The largest differences in college success rates by high school coursework and HSGPA were generally seen for either college enrollment or completing a bachelor's degree (Tables A-1 to A-4). For instance, about one-half of four-year students with a HSGPA of 3.5 or higher earned a bachelor's degree by year 4, and three-fourths of them did so by year 6. In comparison, fewer than 40% of students with a HSGPA lower than 3.0 earned a bachelor's degree by year 6.

High school coursework and ACT Benchmark attainment combined. In the previous section, we reported that college success rates were higher for students who had taken higher-level mathematics and science coursework in high school. But, when we compared college success rates by both high school coursework taken and Benchmark attainment in the same subject area, we found that students who take higher-level coursework but do not meet the level of preparation necessary for entry-level credit-bearing college coursework are less likely to succeed in college than students who take fewer higher-level courses but do meet this level of preparation. This finding is illustrated in Figure 6, where four-year students who took Algebra I, Geometry, and Algebra II in high school and met the ACT Mathematics Benchmark had higher bachelor's degree completion rates than those who took mathematics coursework beyond Algebra II but did not meet the Benchmark.[19]

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[19] We did not include students who took less than Algebra I, Geometry, and Algebra II in the figure since the number of students meeting the ACT Mathematics Benchmarks for this group was substantially smaller than the corresponding numbers for the other mathematics coursework groups.
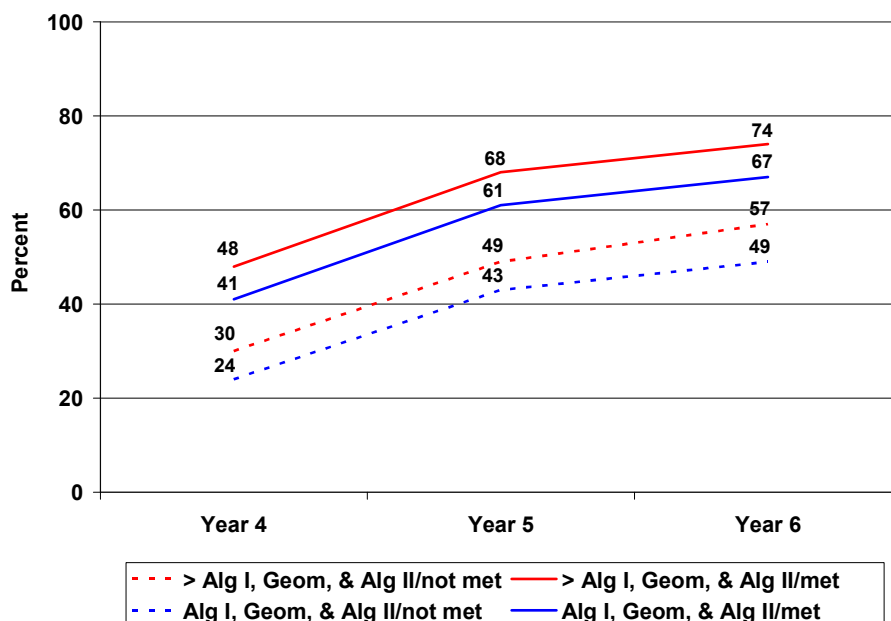
Figure 6. Bachelor's degree completion rates by high school mathematics coursework taken and ACT Mathematics Benchmark attainment for four-year students. Solid lines are for those who met the Benchmark and dashed lines are for those who did not meet the Benchmark. Alg = Algebra; Geom = Geometry.

Four-year students who took Biology and Chemistry in high school and met the ACT Science Benchmark had higher retention rates over time than those who took Biology, Chemistry, and Physics in high school but did not meet the ACT Science Benchmark (Figure 7).
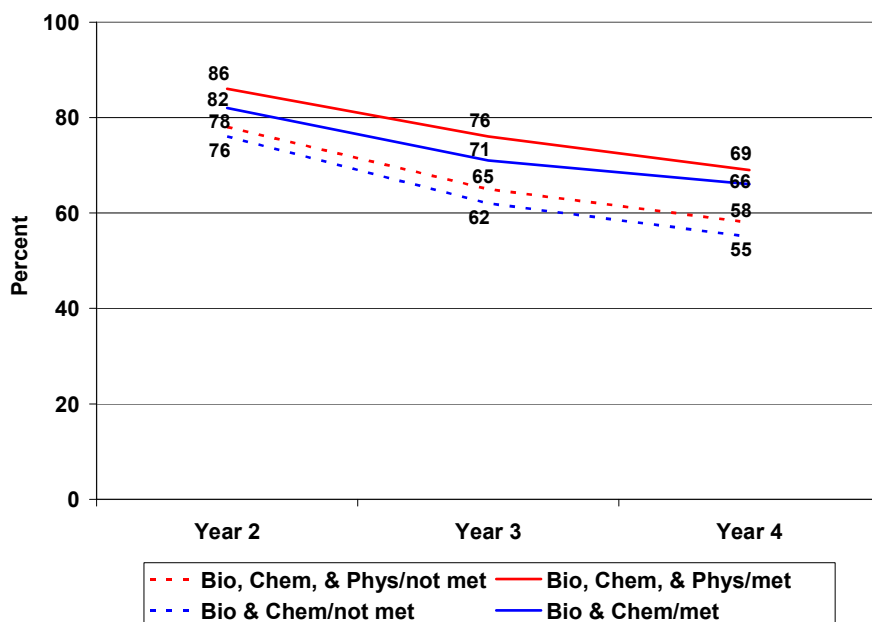
Figure 7. Retention rates to the same institution by high school science coursework taken and ACT Science Benchmark attainment for four-year students. Solid lines are for those who met the Benchmark and dashed lines are for those who did not meet the Benchmark. Bio = Biology; Chem = Chemistry; Phys = Physics.

These findings suggest that simply taking more courses is not enough to prepare students for college-level coursework. High school courses taken must be of sufficient depth and rigor to prepare students for college and career.

Student demographics. The relationships previously reported for all students held true when examined by gender, race/ethnicity, and family income range. For example, for all student demographic groups, as the number of Benchmarks met increased, college success rates also increased (see Figure 8 for retention rates at year 4 by family income range and Figure 9 for six-year bachelor's degree completion rates by race/ethnicity). However, the relative position of each family income range generally remained the same, regardless of the number of Benchmarks met. This latter finding also held true across the racial/ethnic groups for some but not all of the outcomes (i.e., for degree completion but not for college enrollment).
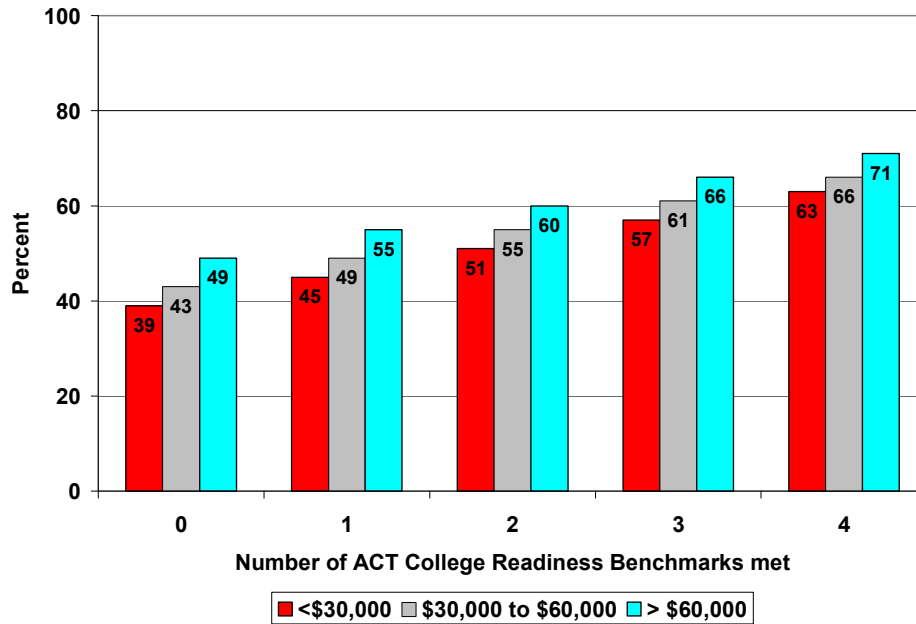
Figure 8. Retention rates to the same institution at year 4 by family income range and number of ACT Benchmarks met for four-year students.
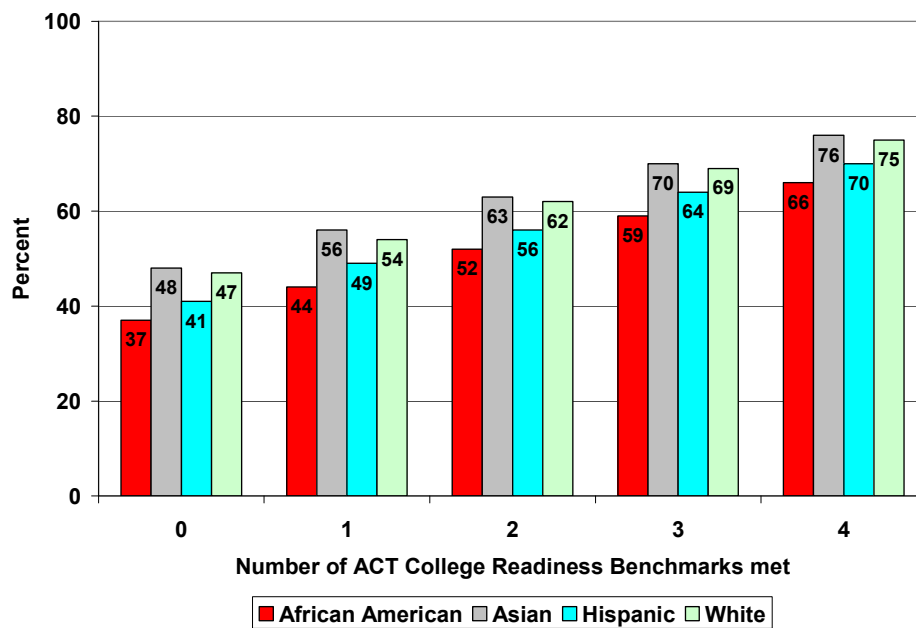
Figure 9. Six-year bachelor's degree completion rates by race/ethnicity and number of ACT Benchmarks met for four-year students.

Section summary. College success rates were generally higher for college-ready students from both two- and four-year institutions than for those not ready for college and career, and held true when examined by gender, race/ethnicity, and family income range. In addition, while taking the right courses in high school appeared to help improve college success rates, Benchmark attainment was more important for college success.

College Readiness Reduces Racial/Ethnic and Family Income Gaps in College Success Rates

It was previously shown that gaps exist in college success rates across racial/ethnic and family income groups (see Appendix A and Figures 1 and 2). But, gaps in college readiness rates also exist among these groups: underrepresented racial/ethnic minority students and lower-income students were less likely than White and higher-income students, respectively, to be academically prepared for college and career. In particular, they were less likely to

- meet the ACT College Readiness Benchmarks;

- earn a higher ACT Composite score;

- take higher level mathematics coursework in high school; and

- earn a higher HSGPA.

For example, for the ACT-tested 2003 high school graduating class, 58% of African American students, 46% of Hispanic students, and 45% of lower-income students met none of the ACT Benchmarks, compared to 19% of White students and 15% of higher-income students.

When college success rates were evaluated by both student demographic group and the number of ACT College Readiness Benchmarks met, we found for all student demographic groups that as the number of Benchmarks met increased, college success rates also increased (see Figures 8 and 9). These results also suggested that college readiness helps reduce the

racial/ethnic and family income gaps in college success rates. Reductions in gaps were generally smaller for two-year students than for four-year students.[20] And, reductions in family income gaps in college success rates were generally smaller than those for racial/ethnic gaps.

To illustrate, for retention to the same institution at year 4 for four-year students, the overall difference in retention rates between family income groups was 13 percentage points (62% vs. 49%; Figure 2). However, for the same students who met all four of the ACT College Readiness Benchmarks, the difference in retention rates at year 4 was reduced by 5 percentage points to a 8 percentage point difference (71% vs. 63%; Figure 8). For two-year students, the income gap in retention rates at year 4 was reduced by only 2 percentage points (from 15 to 13 percentage points).

For six-year bachelor's degree completion rates for four-year students, the overall difference in rates between Hispanic and White students was 11 percentage points (53% vs. 64%; Figure 1) and 19 percentage points between African American and White students (45% vs. 64%). However, for four-year students who met all four of the ACT College Readiness Benchmarks, the difference in six-year bachelor's degree completion rates was reduced by 6 percentage points to a 5 percentage point difference between Hispanic and White students (70% vs. 75%; Figure 9) and reduced by 10 percentage points to a 9 percentage point difference between African American and White students (66% vs. 75%). For two-year students, the gap in the six-year associate's or bachelor's degree completion rate between underrepresented racial/ethnic minority students and White students was reduced by 4 percentage points for those who met 3 or 4 of the Benchmarks (from 17 to 13 percentage points).

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[20] For two-year college outcomes by racial/ethnic group and the number of ACT Benchmarks met, we compared racial/ethnic minority students and White students who met 3 to 4 of the ACT Benchmarks since the numbers of African American and Hispanic two-year students who met all four Benchmarks were relatively small (15 or fewer students).

College Success Rates for Students who Participated in an Early Monitoring System

ACT research has repeatedly shown that students benefit from participating in an early monitoring system, such as that provided by EXPLORE, PLAN, and the ACT (ACT, in press; ACT, 2009b). Results show that early monitoring (as measured by EXPLORE and PLAN) is associated with increased educational achievement, college and career readiness, college enrollment, and persistence to the second year of college. In addition, early monitoring appears to encourage students to take more college-preparatory courses in high school and to promote educational and career planning. In this section, we evaluate the benefits of this early monitoring system on longer-term college outcomes.

Estimated enrollment rates, retention rates at year 4 for four-year students, and six-year bachelor's degree completion rates for four-year students were higher for EPA-tested students than for ACT-tested only students, after controlling for ACT Composite score. This finding is illustrated in Figure 10 for six-year bachelor's degree completion rates; six-year degree completion rates were 2 to 4 percentage points higher for EPA-tested students. Differences of similar magnitude among the early monitoring group were seen in retention rates at year 4 for four-year students (by 2 to 4 percentage points), and larger differences were seen in immediate enrollment rates (3 to 13 percentage points higher for EPA-tested students compared to ACT-tested only students).[21] For two-year students, there were no significant differences in college success rates between the participation groups.

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[21] Larger differences among the EPA participation groups were seen for students with lower ACT Composite scores.
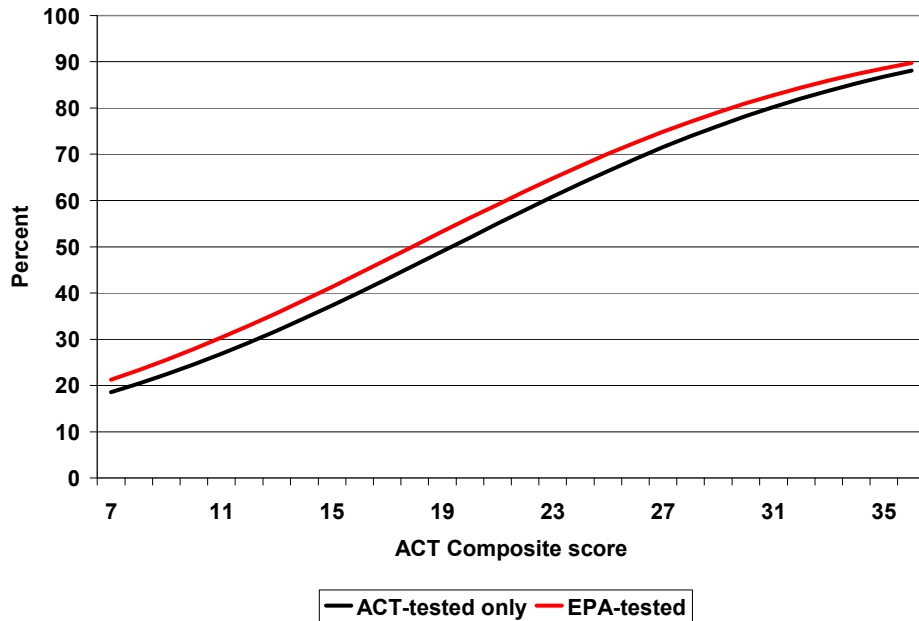
Figure 10. Six-year bachelor's degree completion rates by participation group and ACT Composite score for four-year students.

Early Indicators of being on Target to Graduate from High School College and Career Ready are Predictive of College Success

In this section, we show the utility of early indicators of college readiness for predicting college success. We examine college success rates by EXPLORE, PLAN, and combined EXPLORE/PLAN Benchmark attainment for EPA-tested students. Differences in college success rates by PLAN Benchmark attainment for PA-tested students were found to be comparable to those presented for EPA-tested students and therefore are not presented in this report.

EXPLORE and PLAN Benchmarks for EPA-tested students. As the number of EXPLORE or PLAN Benchmarks met increased, the estimated college success rates generally increased (see Tables B-1 to B-3 from Appendix B). This finding is illustrated in Figure 11 for six-year degree completion rates by number of EXPLORE Benchmarks met.
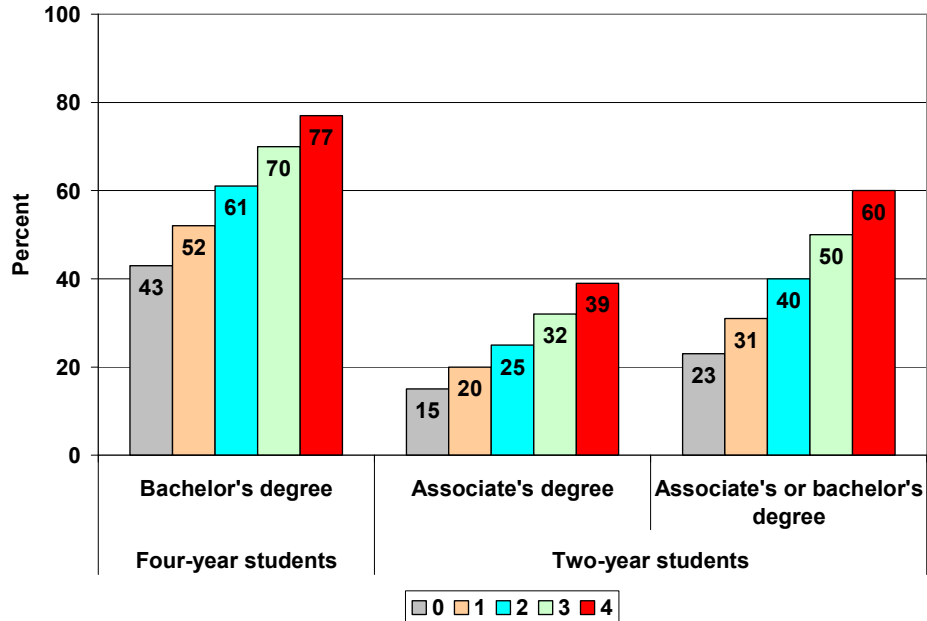
Figure 11. Six-year bachelor's degree completion rates by number of EXPLORE Benchmarks met.

For four-year students, over three-fourths of EPA-tested students who met all four of the EXPLORE Benchmarks in grade 8 completed a bachelor's degree within six years of enrolling in college. In comparison, only 43% of EPA-tested students who did not meet any of the EXPLORE Benchmarks did so. Two-year students who met all four of the EXPLORE Benchmarks in grade 8 were nearly three times as likely as those who met none of the Benchmarks in grade 8 to complete an associate's degree (39% vs. 15%, respectively) or an associate's or bachelor's degree (60% vs. 23%) by year 6.

College success rates were also higher for students who met the individual subject area EXPLORE or PLAN Benchmarks than for students who did not meet the Benchmarks (Appendix B). College success rates by EXPLORE and PLAN Benchmark attainment were generally comparable to those by ACT Benchmark attainment.

EXPLORE or PLAN Composite score for EPA-tested students. Estimated college success rates were higher for students with higher Composite scores than for students with lower scores. This finding held true for both EXPLORE and PLAN Composite scores (see Figure 12 for bachelor's degree completion rates across PLAN Composite scores for EPA-tested students).
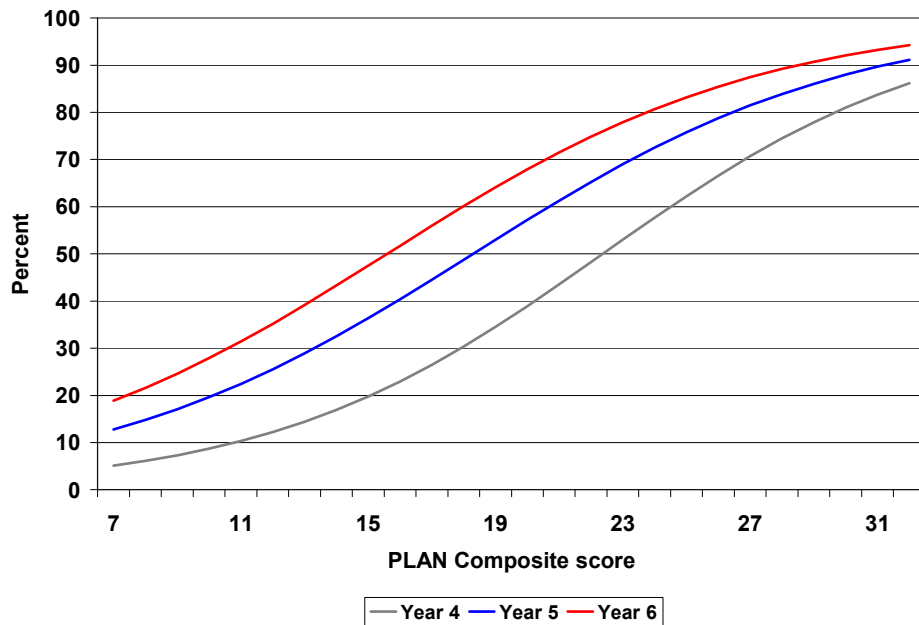
Figure 12. Bachelor's degree completion rates by PLAN Composite score for four-year EPA-tested students. Table B-4 in Appendix B contains the relevant regression coefficients for the degree completion models using EXPLORE or PLAN Composite score as the predictor for EPA-tested students.

Combined EXPLORE/PLAN Benchmark attainment for EPA-tested students. Students who met all four Benchmarks in both grades 8 and 10 were substantially more likely than students who did not meet any of the Benchmarks in grades 8 and 10 to

- enroll immediately in college the fall following high school graduation (by 24 percentage points (77% vs. 53%); Table B-1);

- remain enrolled at the same institution for four-year students (by 20 percentage points at year 2 (86% vs. 66%) and 35 percentage points at year 4 (74% vs. 39%); Table B-2);

- remain enrolled at any institution for two-year students (by 20 percentage points at year 2 (85% vs. 65%) and 38 percentage points at year 4 (69% vs. 31%); Table B-2);

- earn a bachelor's degree by years 4, 5, and 6 for four-year students (by 42 to 44 percentage points (80% vs. 38% by year 6); Table B-3);

- earn an associate's degree by years 4, 5, and 6 for two-year students (by 25 to 29 percentage points (43% vs. 14% by year 6); Table B-3); and

- earn an associate's or bachelor's degree for two-year students by year 6 (by 46 percentage points (66% vs. 20%)).

The largest differences in rates between these two groups of students were in degree completion. In particular, over 50% of four-year students who met all four Benchmarks in both grades 8 and 10 earned a bachelor's degree (56%) by year 4, and nearly 50% of similar two-year students earned an associate's or bachelor's degree (46%) by year 4. In comparison, for students who met none of the Benchmarks in both grades, only 38% of four-year students and 20% of two-year students did so by year 6.

Students who met 1 to 3 Benchmarks in both grades 8 and 10 also had higher college success rates than those who met none of the Benchmarks in both grades, but they had lower college success rates than students who met all four Benchmarks in both grades 8 and 10. This finding is illustrated in Figure 13 for retention rates over time for four-year students.

Figure 13. Retention rates to the same institution over time by combined EXPLORE/PLAN Benchmark attainment for EPA-tested four-year students.

When success rates were evaluated by combined EXPLORE/PLAN individual subject Benchmark attainment, college success rates were found to be the highest for students who met the Benchmarks in both grades 8 and 10 and lowest for students who did not meet the Benchmarks in both grades. College success rates for students who did not meet the Benchmark in grade 8 but did in grade 10 were similar to those seen for students who met the Benchmark in grade 8 but did not in grade 10.[22] This finding is illustrated in Figure 14 for six-year bachelor's degree completion rates for four-year students.

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[22] Across the subject areas, over 75% of the students in these two groups typically had EXPLORE and PLAN scores at or near the Benchmark (within 2 points).
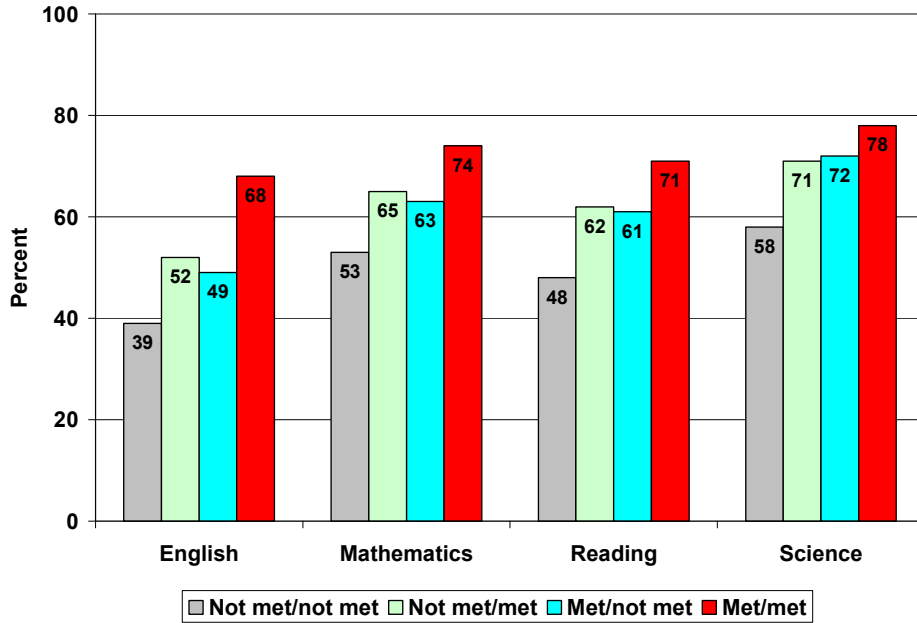
Figure 14. Six-year bachelor's degree completion rates by combined EXPLORE/PLAN Benchmark attainment for four-year students.

And, students who met the Benchmark in grade 8 were substantially more likely to meet the corresponding PLAN Benchmark in grade 10 than those who did not meet the EXPLORE Benchmark in grade 8. This finding is illustrated in Figure 15 for all 2003 EPA-tested high school graduates.
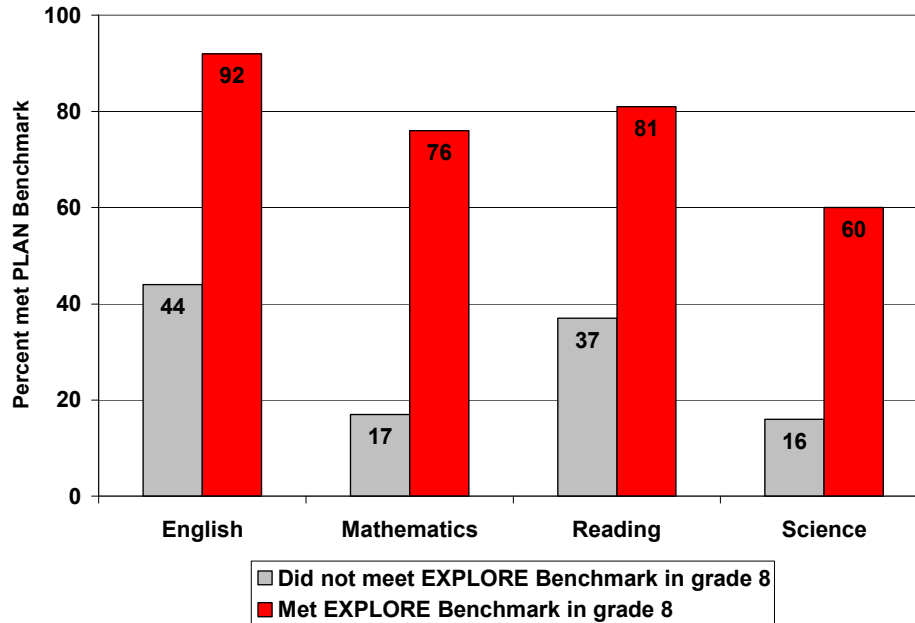
Figure 15. Percentages of students meeting PLAN Benchmarks in grade 10 by EXPLORE Benchmark attainment in grade 8 for 2003 EPA-tested high school graduates.

Student demographic groups. Across student demographic groups, college success rates were higher for students who met individual EXPLORE or PLAN Benchmarks or greater numbers of Benchmarks than for students who did not. We also found that students who were on target in grades 8 and 10 to becoming college ready in all four subject areas were substantially more likely to be successful in college than those who were not on target in either grade, irrespective of demographic group considered.[23] This finding is illustrated in Figure 16 for college enrollment rates by combined EXPLORE/PLAN Benchmark attainment.

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[23] For some of the racial/ethnic groups, the number of students meeting all four Benchmarks in both grades 8 and 10 was small (<10). In these cases, we compared college success rates between underrepresented racial/ethnic minority students and White students.
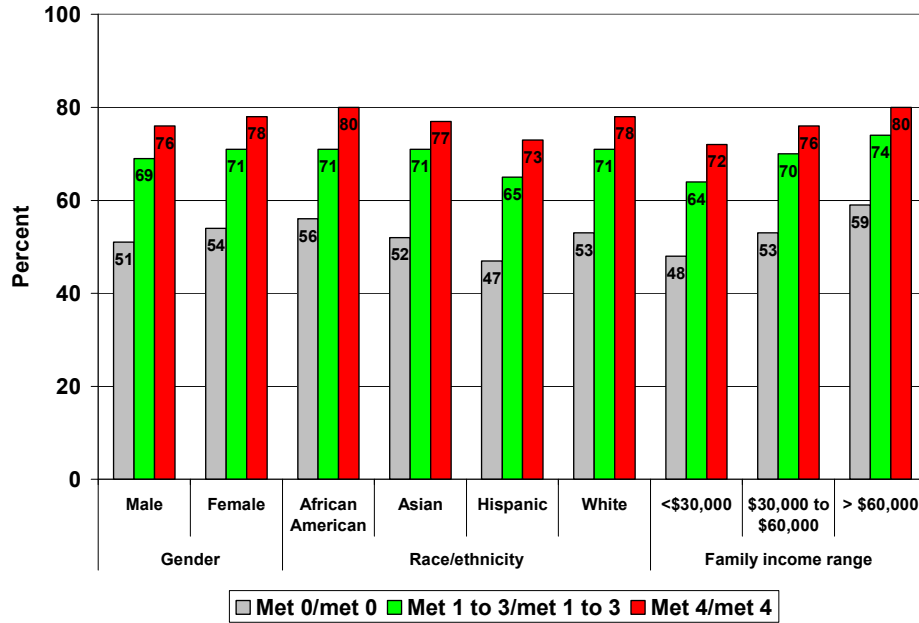
Figure 16. College enrollment rates by combined EXPLORE/PLAN Benchmark attainment and student demographic group for EPA-tested students.

Section summary. College success rates were generally higher for students who were on target in grades 8 and 10 for becoming college ready than for students who were not on target. This result held true for both two- and four-year students and by gender, race/ethnicity, and family income range. In addition, students who were on target in grade 8 were substantially more likely to be on target in grade 10 for becoming college ready – this finding emphasizes the importance of students being on track early (by grade 8).

Remaining on Target and Graduating from High School College and Career Ready Improves College Success Rates

In this section, we examine college success rates by combined EXPLORE/PLAN/ACT Benchmark attainment to evaluate the importance of remaining on target and graduating from high school college and career ready. We also examine the likelihood of students meeting the

ACT Benchmark by early indicators of being on target to graduate from high school college and career ready.

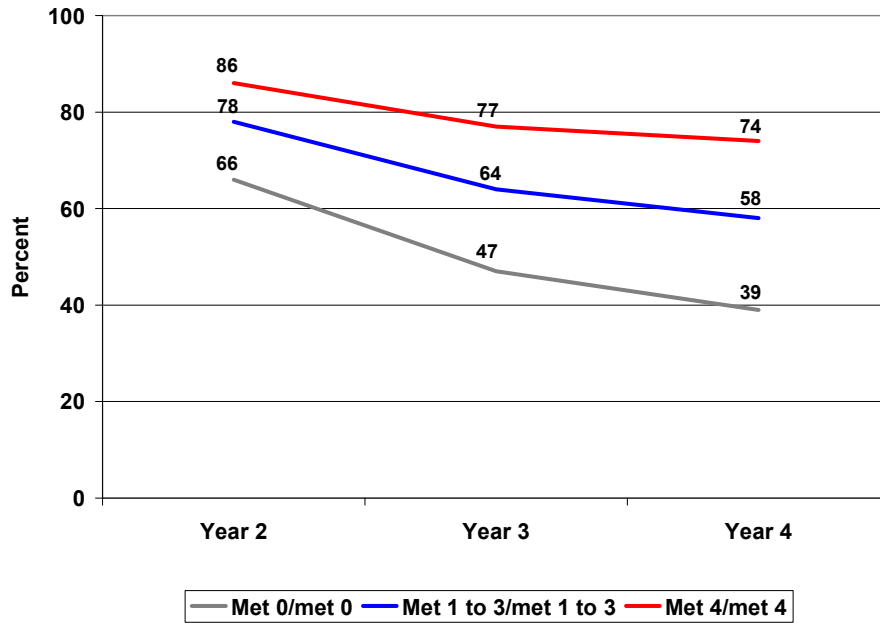**Combined EXPLORE/PLAN/ACT Benchmarks for EPA-tested students**. Students who met all four of the Benchmarks in grades 8, 10, and 11/12 were substantially more likely than students who did not meet any of the EXPLORE, PLAN, and ACT Benchmarks to

- enroll immediately in college the fall following high school graduation (by 27 percentage points (78% vs. 51%); Appendix C, Table C-1);

- remain enrolled at the same institution for four-year students (by 21 percentage points at year 2 (86% vs. 65%) and 37 percentage points at year 4 (75% vs. 38%); Table C-2);

- remain enrolled at any institution for two-year students (by 21 percentage points at year 2 (86% vs. 65%) and 40 percentage points at year 4 (71% vs. 31%); Table C-2);[24]

- earn a bachelor's degree by years 4, 5, and 6 for four-year students (by 45 to 47 percentage points (81% vs. 36% by year 6); Table C-3);

- earn an associate's degree by years 4, 5, and 6 for two-year students (by 27 to 31 percentage points (45% vs. 14% by year 6); Table C-3); and

- earn an associate's or bachelor's degree for two-year students by year 6 (by 47 percentage points (67% vs. 20%)).

In addition, students who met 1 to 3 Benchmarks in grades 8, 10, and 11/12 had higher college success rates than those who did not meet any of the Benchmarks in all three grades, but had lower college success rates than students who met all four Benchmarks in all three grades.

Increases in the number of Benchmarks met between grades 10 and 11/12 were associated with increases in the chances of EPA-tested students being successful in college. For

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[24] There were only 24 two-year students who met all four of the Benchmarks in grades 8, 10, and 11/12; these results should be interpreted with caution.

example, among students who met 0 to 2 Benchmarks in grades 8 and 10, those who met 3 to 4 ACT Benchmarks in grade 11/12 had higher college success rates than those who met 0 to 2 of the Benchmarks in grade 11/12.[25] This finding held true across college outcomes (Appendix C) and is illustrated in Figure 17 for six-year degree completion rates. In particular, among students who met 0 to 2 Benchmarks in grades 8 and 10, six-year bachelor's degree completion rates were 17 percentage points higher for students who improved and met 3 to 4 ACT Benchmarks in grade 11/12 compared to those who met 0 to 2 Benchmarks in grade 11/12 (67% vs. 50%).
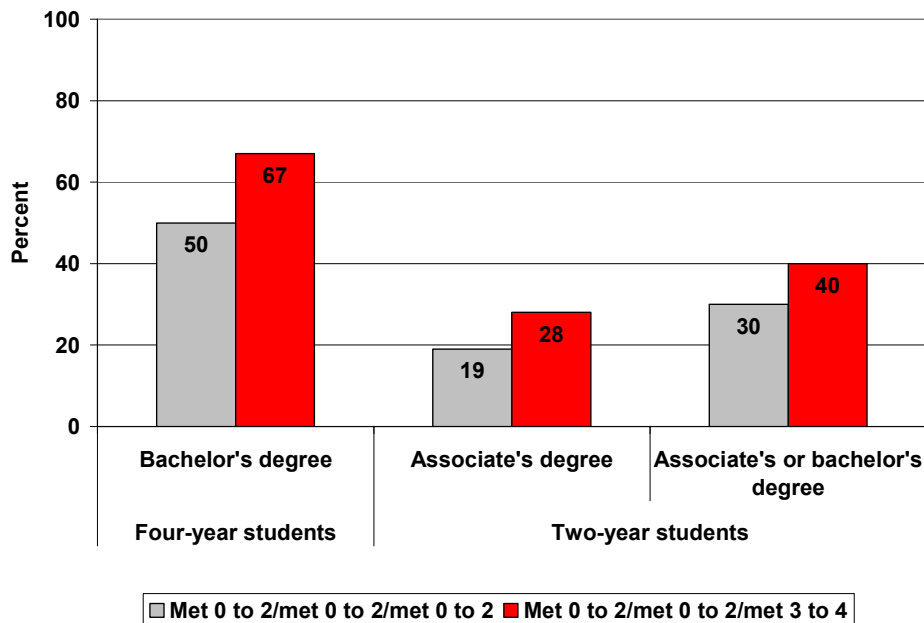
Figure 17. Six-year degree completion rates for EPA-tested students who met 0 to 2 Benchmarks in grades 8 and 10 by number of ACT Benchmarks met.

Moreover, for students who are on target early in grades 8 and 10, it is important for these students to remain on track through grade 11/12. Figure 18 shows bachelor's degree

[25] We also considered an alternative grouping for the number of Benchmarks met (0 to 1, 2, 3 to 4) to further evaluate this finding. Among students who met 2 Benchmarks in grades 8 and 10, the estimated six-year bachelor's degree completion rates for four-year students were 52% for students who met 0 to 1 Benchmark in grade 11/12, 61% for students who met 2 Benchmarks, and 69% for those who met 3 to 4 Benchmarks. The corresponding percentages for six-year associate's or bachelor's degree completion rates for two-year students were 39%, 42%, and 45%, respectively.

completion rates over time for four-year EPA-tested students who met 3 to 4 Benchmarks in grades 8 and 10, but differed in Benchmark attainment at grade 11/12 (see Tables C-1 to C-3 in Appendix C for the same comparison across outcomes). For these students, bachelor's degree completion rates were 13 to 15 percentage points higher for those who met 3 to 4 ACT Benchmarks in grade 11/12, compared to those who met 0 to 2 ACT Benchmarks.
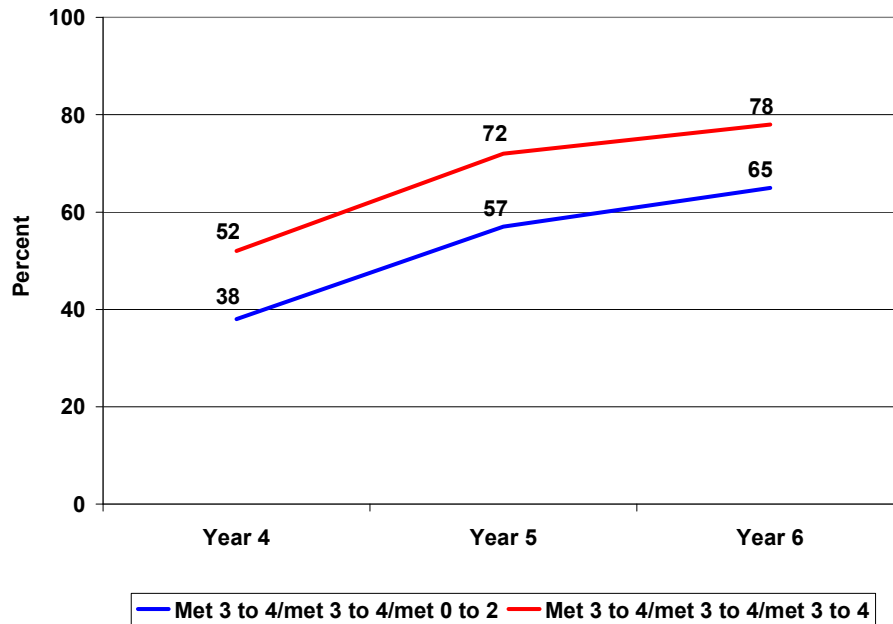
Figure 18. Bachelor's degree completion rates for four-year EPA-tested students who met 3 to 4 Benchmarks in grades 8 and 10 by number of ACT Benchmarks met.

When success rates were evaluated by combined EXPLORE/PLAN/ACT individual subject Benchmark attainment, college success rates were generally highest for students who met the Benchmark in grades 8, 10, and 11/12 and lowest for students who did not meet the Benchmark in any grade. Moreover, among students who met the individual Benchmark in both grades 8 and 10, students who remained on track and met the corresponding Benchmark in grade 11/12 had higher college success rates than students who did not. This finding was consistently seen across college outcomes (Appendix C, Tables C-1 to C-3). Meeting the ACT Benchmark

appeared to be the most critical Benchmark to meet to improve students' chances of being successful in college. This finding is illustrated in Figure 19 for retention rates over time for four-year EPA-tested students by combined EXPLORE/PLAN/ACT Mathematics Benchmark attainment.
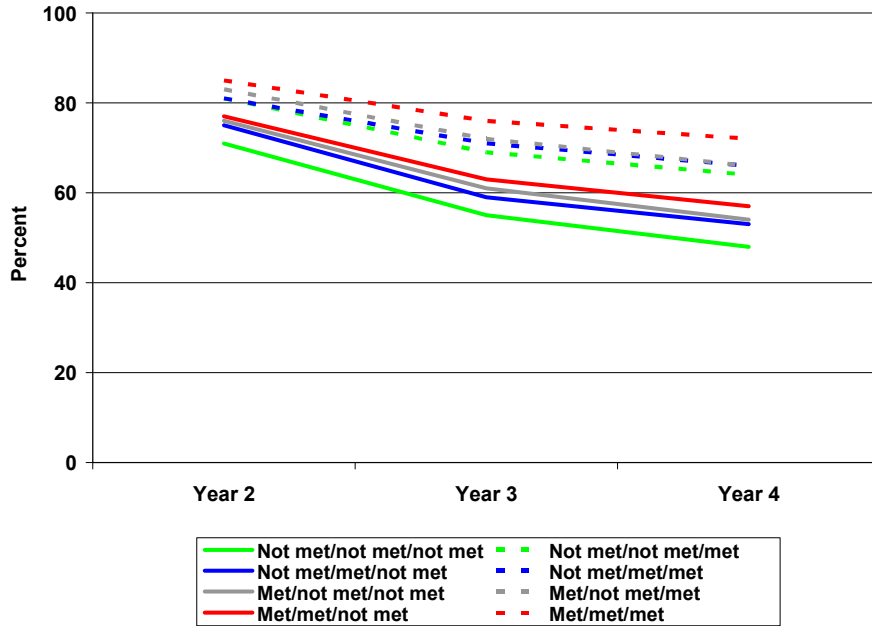
Figure 19. Retention rates to the same institution by combined EXPLORE/PLAN/ACT Mathematics Benchmark attainment and year for four-year EPA-tested students.

However, students who were on target early beginning in eighth grade were the ones who were the most likely to meet the ACT Benchmarks by the time they graduated from high school. This finding is illustrated in Figure 20 for all 2003 EPA-tested high school graduates: Students who met the EXPLORE Benchmark in grade 8 and PLAN Benchmark in grade 10 were substantially more likely to meet the corresponding ACT Benchmark in grade 11/12 than those who did not meet one or both of the EXPLORE and PLAN Benchmarks.
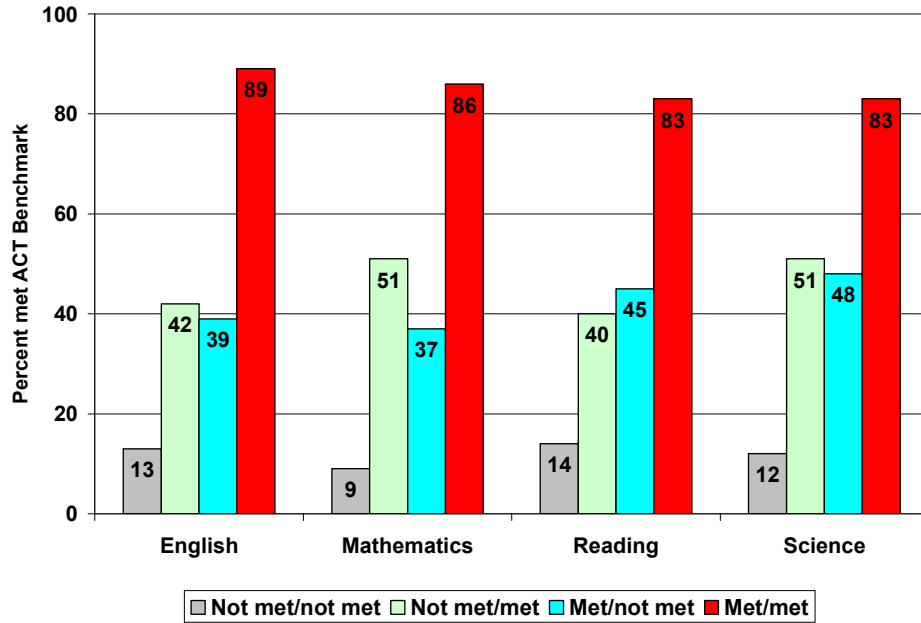
Figure 20. Percentage of students meeting ACT Benchmarks by combined EXPLORE/PLAN Benchmark attainment for 2003 EPA-tested high school graduates.

Student demographic group. Across all student demographic groups, college success rates were higher for students who met all four of the EXPLORE, PLAN, and ACT Benchmarks than for students who did not meet any of the EXPLORE, PLAN, and ACT Benchmarks. This result is illustrated in Figure 21 for six-year bachelor's degree completion rates for four-year EPA-tested students.
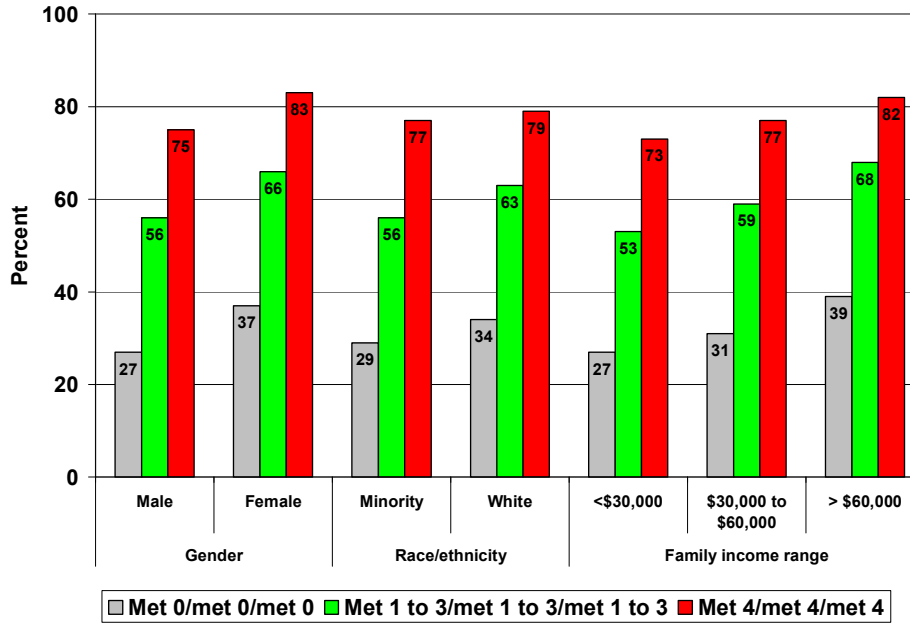
Figure 21. Six-year bachelor's degree completion rates by combined EXPLORE/PLAN/ACT Benchmark attainment and student demographic group for four-year EPA-tested students. For some of the racial/ethnic minority groups, the number of students meeting all four of the EXPLORE, PLAN, and ACT Benchmarks was small (<10). Therefore, we compared minority students to White students.

Section summary. College success rates were generally highest for EPA-tested students who were on target in grades 8 and 10 for becoming college and career ready and then graduated from high school college and career ready. Rates were lowest for students who did not meet any of the EXPLORE, PLAN, and ACT Benchmarks. This result held true for both two- and four-year students, as well as by gender, race/ethnicity, and family income range. In addition, students who were on target for becoming college ready in grades 8 and 10 were substantially more likely to graduate from high school college and career ready, and students who graduated from high school college and career ready were more likely to be successful in college than those who did not.

Degree Completion Rates by Benchmark Attainment for All ACT-Tested High School Graduates

The results shown earlier pertained to the group of students that postsecondary institutions are generally interested in studying, namely high school graduates who enrolled in college. Moreover, the results were disaggregated by institution type. However, college-ready students are substantially more likely than students who are not ready to enroll immediately in college. Thus, the results shown earlier are likely overestimates of those that would be seen for all ACT-tested high school graduates.

To explore this issue, degree completion rates were estimated by Benchmark attainment, as well as by Composite score, for all high school graduates using a sample of enrolled and non-enrolled students. This sample included both the random sample of 24,850 immediately enrolled students described earlier and a random sample of 2,944 ACT-tested 2003 high school graduates who did not immediately enroll in college in fall 2003. For the latter sample, EPA-tested and PA-tested only students were oversampled in similar ratios to those for the immediately enrolled sample; we did not oversample certain racial/ethnic groups.

Some of the students from the latter sample delayed enrollment and thus had NSC follow-up data available through fall 2010.[26] Seven percent of these students earned either an associate's or bachelor's degree by fall 2010. Weighted logistic regression models were used to estimate degree completion rates for all ACT-tested high school graduates. Weights for the two samples were calculated independently in a similar fashion to those previously described for the immediately enrolled sample, but were normalized when combined together to account for overrepresentation of the immediately enrolled students.

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[26] We assumed that students who did not match to NSC data did not enroll in college during the study time frame. This is a reasonable assumption given that NSC captures enrollment for 93% of all U.S. college students.

Table 8 contains estimated bachelor's, and associate's or bachelor's, degree completion rates for all ACT-tested high school graduates by ACT Benchmark attainment. Of students who met none of the ACT Benchmarks, only 18% completed a bachelor's degree and 25% completed an associate's or a bachelor's degree within six years after graduating from high school. In comparison, students who met all four ACT Benchmarks were nearly 3 to 4 times as likely to complete a degree within the same six-year time period.

Table 8

Estimated College Degree Completion Rates by ACT Benchmark Attainment for Entire ACT-Tested 2003 High School Graduating Class

ACT Benchmark	Level/value	Bachelor's degree			Associate's or bachelor's degree		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
English	Not met	7	15	19	12	21	26
	Met	27	42	49	32	48	54
Mathematics	Not met	10	21	26	16	27	33
	Met	35	53	60	40	58	65
Reading	Not met	10	21	26	16	27	33
	Met	30	46	52	35	51	57
Science	Not met	14	26	32	20	32	39
	Met	38	55	61	41	59	66
Number met	0	6	13	18	11	20	25
	1	10	22	28	17	29	35
	2	18	33	40	25	40	47
	3	29	47	54	35	52	59
	All 4	44	61	67	46	64	70

Note. Analyses based on a random sample of 27,792 ACT-tested 2003 high school graduates. Sample included immediately enrolled students, delayed enrolled students, and students who did not enroll in college.

In addition, ACT-tested high school graduates with higher ACT Composite scores had higher chances of completing a bachelor's degree (Figure 22). Bachelor's degree completion rates for all ACT-tested high school graduates were lower than those for students who immediately enrolled in a four-year institution after high school graduation, in particular for

those who met none of the ACT Benchmarks, or those with lower ACT Composite scores (compare the results in Table 8 to those in Table A-4 by Benchmark attainment and those in Figure 22 to those in Figure 4 by Composite score).
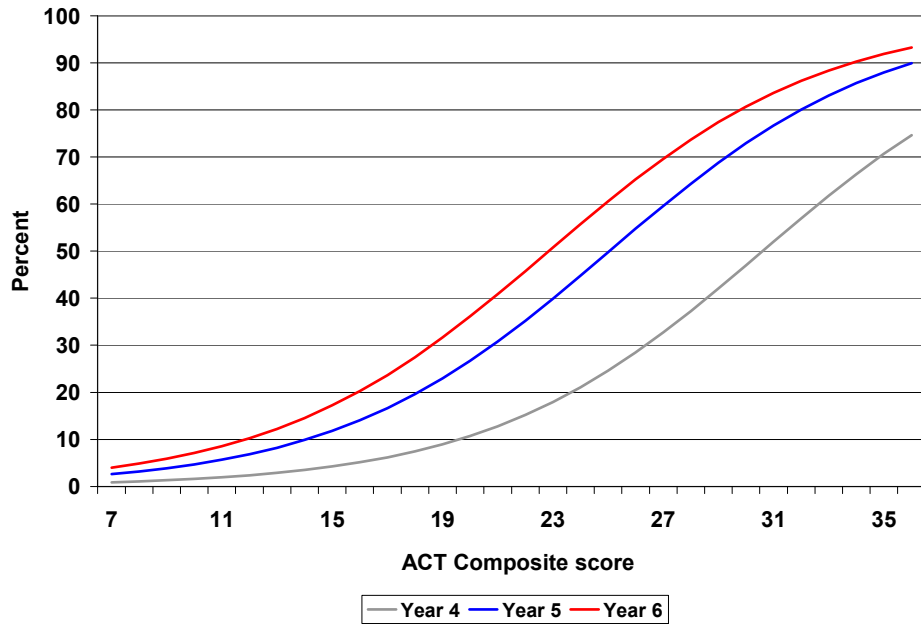
Figure 22. Estimated bachelor's degree completion rates by ACT Composite score for all ACT-tested high school graduates. Analyses based on a random sample of 27,792 ACT-tested 2003 high school graduates. Sample included immediately enrolled students, delayed enrolled students, and students who did not enroll in college. Table D-1 in Appendix D contains the relevant estimated regression coefficients for the degree completion models using ACT Composite scores as the predictor for all ACT-tested high school graduates, as well as the corresponding coefficients for the models using EXPLORE or PLAN Composite scores for EPA-tested graduates.

In Appendix D, we provide estimated degree completion rates by EXPLORE or PLAN Benchmark attainment for all EPA-tested students. As was found for the immediately enrolled sample, the estimated rates by EXPLORE or PLAN Benchmark attainment were somewhat comparable to those by ACT Benchmark attainment. One limitation to the EXPLORE and PLAN rates is that they are based on ACT-tested high school graduates. Some students may not persist to high school graduation and/or not take the ACT; thus, these rates are likely overestimated

slightly compared to those for all EXPLORE-tested eighth-graders or PLAN-tested tenth-graders.

Conclusions

In the first part of this study, we examined the relationships between college readiness and college success from a national perspective. In particular, we examined college retention and degree completion rates over time across college readiness indicators for a national NSC-matched sample of ACT-tested 2003 high school graduates who enrolled in college in fall 2003. The second part of this study focused on evaluating the benefits of early monitoring of college readiness on long-term college success.

The Importance of College Readiness on College Success

The general conclusions from the first part of this study affirm those found in an earlier ACT study (Noble & Radunzel, 2007), namely that typical college success rates for both two- and four-year institutions are generally higher for college-ready students than for those not ready. In particular, we found that students who met the individual ACT College Readiness Benchmarks were substantially more likely than those who did not meet the Benchmarks to enroll immediately in college the fall following high school graduation, to persist in college through degree completion, and to earn a degree in a timely manner. Moreover, as the number of ACT Benchmarks met increased, students' likelihood of success also increased. For students who initially enrolled in a two-year institution, these findings held true for all outcomes, except for retention to the same institution at years 3 and 4. This exception is likely explained by the result that college-ready students transferred to other institutions and completed a degree at higher rates than students who were not ready for college and career, as evidenced by the higher

six-year associate's or bachelor's degree completion rates for these two-year students. College success rates were also higher for students who

- earned higher ACT Composite scores (compared to those with lower scores);

- took a core curriculum in high school (compared to those who did not);

- took higher-level mathematics and science coursework in high school (compared to those who did not); and

- earned higher high school GPAs (compared to those with lower GPAs).

We also found that simply taking higher-level high school coursework is insufficient to guarantee that students will be successful in college. In particular, we found that students who took higher-level mathematics and science coursework, but did not meet the level of achievement in these areas necessary to be ready for credit-bearing, entry-level college coursework, were less likely to persist over time to degree completion than those who took fewer courses, but did meet this level of achievement.

In addition, consistent with findings from other studies (ACT, 2010a; Aud et al., 2011; Snyder & Dillow, 2011), there were gaps in enrollment, retention, and degree completion rates across racial/ethnic and family income groups. However, we saw that college readiness helps to reduce these gaps. For example, the differences in six-year bachelor's degree completion rates between African American or Hispanic students and White students were reduced by more than 50% among those who had met all four of the ACT College Readiness Benchmarks. Reductions in family income gaps in college success rates were generally smaller than those in the racial/ethnic gaps. This finding suggests that it is very likely that non-academic issues, including financial aid and needing to work while in college, are also important factors in college success.

One limitation to the degree data for this study was that we were not provided with the actual degree type earned for all students with degrees. For these cases, we implied the type of degree using the institution type of the awarding institution and the time to degree completion. However, we found no differences in comparisons between students with known degrees and those with implied degrees. In addition, six-year associate's and bachelor's degree completion rates from this study were only slightly higher than those from another nationally representative sample of two- and four-year students who began postsecondary education in 2003-04 (Skomsvold, Radford, & Berkner, 2011).[27]

This study primarily focused on retention and degree completion for students who immediately enrolled in college, which is common in the higher education literature. For some limited supplemental analyses, we also estimated degree completion rates for a representative sample of ACT-tested high school graduates that included students who did and did not immediately enroll in college. Degree completion rates by college readiness indicators from this different perspective might be more meaningful to secondary educators.

The Importance of Early Monitoring of College Readiness on College Success

Our nation's school systems are being encouraged to implement integrated, longitudinal data-driven systems for early monitoring of college readiness (Achieve, 2009; Data Quality Campaign, 2009; Partnership for Learning, 2010). For this study, we deliberately oversampled EPA-tested students to document the benefits of participating in a longitudinal assessment system on longer-term college outcomes and to examine the relationships between early indicators of college readiness and college success. First, we found that EPA-tested students had

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[27] The six-year bachelor's degree completion rate for four-year students from this study was 61%, compared to 59.5% for four-year students from the NCES study (Skomsvold et al, 2011). The six-year associate's degree completion rate for two-year students from this study was 24%, compared to 15.5% for two-year students from the NCES study. A possible explanation for this difference is that we focused on ACT-tested students; the ACT is generally not required for admissions to two-year institutions.

higher immediate college enrollment rates than ACT-tested only students, and slightly higher retention rates at year 4 and Bachelor degree completion rates by year 6. The latter two findings were seen for four-year students only.

In conjunction with assessing student progress, EXPLORE, PLAN, and the ACT help students plan for the future by providing information on careers that match their interests and skills (through the Interest Inventory and World-of-Work map). Therefore, a plausible explanation for these results is that early monitoring and intervening over time raises student's and parent's awareness of the opportunities available to students after high school, along with helping them to know how well students must perform academically to have a reasonable chance of being successful in college or on the job. By encouraging students to think about possible careers early on allows them to plan more effectively to take the academic courses they will need to achieve their career goals.

The results related to the benefits of early monitoring from this study are in agreement with two other recent ACT studies. In one of these studies (Radunzel, 2010), the researchers found that EPA-tested students in Arkansas and Oklahoma (two states that administer EXPLORE and PLAN on a state-funded voluntary basis) consistently outperformed ACT-tested only students in these states; that is, they were more likely to enroll immediately in college, to persist at the same institution, and to complete a degree. Differences in college success rates among the EPA participation groups were smaller in this study than the earlier study that focused on Arkansas and Oklahoma. The other study (ACT, in press) found that EPA-tested students were more likely than ACT-tested only students to enroll immediately in college the fall following high school graduation and remain enrolled at the same institution through year 2. Differences in immediate college enrollment rates among the EPA participation groups found in

this study were similar to those reported in the earlier study. All three studies accounted for student's achievement level (either ACT Composite score or high school GPA).

We also demonstrated the utility of predicting college success rates by using early indicators of being on target to graduate from high school college and career ready. In particular, we found that students who met both the EXPLORE and PLAN Benchmarks had higher college success rates than those who met one or none of the Benchmarks. Similar results were seen when we examined the college success rates between those who met and did not meet the individual EXPLORE or PLAN Benchmarks. In addition, as the number of EXPLORE or PLAN Benchmarks met increased, college success rates also increased. These results provide further validity evidence for the use of EXPLORE and PLAN Benchmarks as a means of evaluating students' early progress toward college readiness, so that timely interventions can be made when necessary.

When we examined college success rates by combined EXPLORE/PLAN/ACT Benchmark attainment, we found that students who were on target in grades 8 and 10 for becoming college and career ready and then graduated from high school college and career ready generally had the highest college success rates, and students who were not on target in grades 8 and 10 and did not graduate from high school college and career ready had the lowest rates. We also showed examples where the chances of being successful in college appeared to

- increase for students who showed improvements in the number of Benchmarks met between grades 10 and 11/12, and
- decrease for students who did not remain on target through grade 11/12.

One of the major findings from *The Forgotten Middle* (ACT, 2008) was that being on target for college and career readiness in grade 8 puts students on a trajectory for success; that is,

if students are on target to be ready for college and career as early as grade 8, their chances of being ready for college and career by high school graduation are substantially increased. In this study, we found that students who were on target in grades 8 and 10 for becoming college ready were substantially more likely than those who were not on target in both grades to graduate from high school college and career ready. These findings emphasize the importance of students being on track by grade 8 and support the use of a longitudinal assessment system to monitor early and often student's progress towards becoming college ready. Students who are college ready at the time they graduate from high school are more likely than those who are not to persist beyond their first year of college and to complete a degree in a timely manner.

Summary

This study provides additional evidence of the importance of college readiness for timely degree completion for students attending either two- or four-year institutions and for reducing gaps in college success rates across racial/ethnic and family income groups. The ACT College Readiness Benchmarks are good indicators of whether students have acquired the knowledge and skills to be successful in college. In addition, this study documents the utility of early monitoring of readiness through EXPLORE and PLAN scores for increasing college enrollment and college retention through degree completion.

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Appendix A

Table A-1

College Enrollment Rates by Student Characteristics

Characteristic	Level/value	Enrollment rate
Demographic characteristic		
Race/ethnicity	African American	64
	Hispanic	59
	White	70
	Asian	70
Gender	Male	66
	Female	69
Family income	< $30,000	60
	$30,000-$60,000	68
	> $60,000	74
College readiness indicator		
ACT English Benchmark	Not met	57
	Met	73
ACT Mathematics Benchmark	Not met	62
	Met	78
ACT Reading Benchmark	Not met	61
	Met	74
ACT Science Benchmark	Not met	65
	Met	78
Number of ACT Benchmarks met	0	54
	1	67
	2	71
	3	76
	All 4	79
ACT Composite score range	1 to 18	57
	19 to 21	67
	22 to 24	73
	25 to 27	79
	28 to 36	84
Core curriculum	Noncore	60
	Core	72
HS math course sequence	< Alg I, Geom, Alg II	50
	Alg I, Geom, Alg II	66
	> Alg I, Geom, Alg II	75
HS science course sequence	Bio	56
	Bio & Chem	71
	Bio, Chem, & Phys	75

Table A-1 (cont.)

Characteristic	Level/value	Enrollment rate
	< 3.00	55
HSGPA	3.00 to 3.49	69
	> = 3.50	77

Note. HS = high school; Alg = Algebra; Geom = Geometry; Bio = Biology; Chem = Chemistry; Phys = Physics; HSGPA = high school grade point average.

Table A-2

College Retention Rates to the Same Institution by Student Characteristics and Year for Two- and Four-Year Students

		Four-year students			Two-year students		
Characteristic	Level/value	Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
Demographic characteristic							
Race/ethnicity	African American	74	57	48	56	25	12
	Hispanic	77	62	53	66	38	17
	White	78	66	59	61	29	14
	Asian	81	70	62	69	39	14
Gender	Male	75	62	56	60	27	13
	Female	79	66	58	62	32	16
Family income	< $30,000	73	57	49	60	30	15
	$30,000-$60,000	77	63	56	61	30	15
	> $60,000	80	69	62	63	29	14
College readiness indicator							
ACT English Benchmark	Not met	69	53	45	59	31	15
	Met	80	68	61	63	29	13
ACT Mathematics Benchmark	Not met	72	56	49	60	30	15
	Met	83	73	67	65	29	12
ACT Reading Benchmark	Not met	73	58	51	61	31	15
	Met	80	69	62	62	29	13
ACT Science Benchmark	Not met	75	61	53	61	30	15
	Met	83	73	66	65	28	12
Number of ACT Benchmarks met	0	68	51	43	60	31	17
	1	72	58	50	61	30	16
	2	77	64	56	63	29	14
	3	81	69	63	64	28	13
	All 4	84	75	69	65	27	13
ACT Composite score range	1 to 18	68	52	44	60	31	16
	19 to 21	75	60	53	62	29	14
	22 to 24	79	67	60	64	29	13
	25 to 27	83	73	67	65	28	12
	28 to 36	87	80	74	67	27	11
Core curriculum	Noncore	73	60	52	60	30	15
	Core	79	67	60	63	29	14
HS math course sequence	< Alg I, Geom, Alg II	66	48	41	57	27	15
	Alg I, Geom, Alg II	74	60	52	61	31	15
	> Alg I, Geom, Alg II	81	69	62	64	30	13

Table A-2 (cont.)

Characteristic	Level/value	Four-year students			Two-year students		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
HS science course sequence	Bio	70	54	46	59	27	15
	Bio & Chem	78	65	58	62	31	14
	Bio, Chem, & Phys	81	69	62	64	33	15
HSGPA	< 3.00	66	48	40	57	28	13
	3.00 to 3.49	77	63	55	64	30	13
	> = 3.50	84	75	68	69	31	14

Note. HS = high school; Alg = Algebra; Geom = Geometry; Bio = Biology; Chem = Chemistry; Phys = Physics; HSGPA = high school grade point average.

Table A-3

College Retention Rates to Any Institution by Student Characteristics and Year for Two- and Four-Year Students

Characteristic	Level/value	Four-year students			Two-year students		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
Demographic characteristic							
Race/ethnicity	African American	85	73	64	67	45	30
	Hispanic	87	77	69	74	56	43
	White	90	83	77	75	57	46
	Asian	93	88	82	79	61	45
Gender	Male	88	79	72	72	52	41
	Female	91	83	77	75	58	46
Family income	< $30,000	84	73	65	69	49	36
	$30,000-$60,000	89	80	73	74	55	43
	> $60,000	93	87	81	79	62	51
College readiness indicator							
ACT English Benchmark	Not met	84	72	63	70	50	38
	Met	91	84	78	78	60	49
ACT Mathematics Benchmark	Not met	86	75	67	72	53	40
	Met	93	88	83	81	67	55
ACT Reading Benchmark	Not met	87	77	69	72	53	40
	Met	91	85	79	77	61	50
ACT Science Benchmark	Not met	88	79	72	73	54	42
	Met	93	87	82	80	65	54
Number of ACT Benchmarks met	0	85	70	62	70	50	38
	1	88	76	69	73	55	43
	2	91	81	74	77	59	49
	3	93	85	80	80	64	54
	All 4	95	89	84	83	68	59
ACT Composite score range	1 to 18	83	71	62	70	50	38
	19 to 21	88	79	71	76	58	46
	22 to 24	91	84	77	79	63	52
	25 to 27	93	88	83	82	68	58
	28 to 36	95	92	88	85	73	64
Core curriculum	Noncore	86	77	70	71	51	38
	Core	91	83	77	77	60	48
HS math course sequence	< Alg I, Geom, Alg II	81	67	60	66	44	32
	Alg I, Geom, Alg II	88	78	70	74	56	45
	> Alg I, Geom, Alg II	92	85	79	79	64	50

Table A-3 (cont.)

Characteristic	Level/value	Four-year students			Two-year students		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
HS science course sequence	Bio	83	72	63	69	47	36
	Bio & Chem	91	83	76	76	59	47
	Bio, Chem, & Phys	91	85	79	79	65	51
HSGPA	< 3.00	83	69	59	68	47	35
	3.00 to 3.49	91	82	75	78	60	47
	> = 3.50	94	89	85	83	68	57

Note. HS = high school; Alg = Algebra; Geom = Geometry; Bio = Biology; Chem = Chemistry; Phys = Physics; HSGPA = high school grade point average.

Table A-4

Degree Completion Rates by Student Characteristics and Year for Two- and Four-Year Students

Characteristic	Level/value	Four-year students (bachelor's degree)			Two-year students (associate's degree)		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
Demographic characteristic							
Race/ethnicity	African American	21	39	45	12	14	15
	Hispanic	27	45	53	16	20	21
	White	38	58	64	22	25	26
	Asian	36	54	63	14	16	18
Gender	Male	27	49	57	17	19	21
	Female	40	58	64	22	25	27
Family income	< $30,000	25	42	49	16	20	20
	$30,000-$60,000	33	52	59	21	24	26
	> $60,000	41	62	69	21	24	26
College readiness indicator							
ACT English Benchmark	Not met	19	38	45	16	19	20
	Met	41	60	66	23	26	28
ACT Mathematics Benchmark	Not met	26	44	51	18	21	22
	Met	46	66	72	27	30	31
ACT Reading Benchmark	Not met	25	45	53	18	21	22
	Met	42	61	67	23	26	28
ACT Science Benchmark	Not met	30	50	57	19	22	23
	Met	47	66	72	26	29	31
Number of ACT Benchmarks met	0	18	37	44	16	19	21
	1	25	45	52	19	22	23
	2	33	53	60	22	25	26
	3	42	62	68	25	28	29
	All 4	52	69	75	29	31	33
ACT Composite score range	1 to 18	19	37	44	16	19	20
	19 to 21	28	49	56	21	24	25
	22 to 24	37	58	65	24	28	29
	25 to 27	48	67	73	29	32	34
	28 to 36	61	77	81	34	37	39
Core curriculum	Noncore	30	49	55	17	20	22
	Core	37	57	64	22	25	26
HS math course sequence	< Alg I, Geom, Alg II	22	38	44	15	17	19
	Alg I, Geom, Alg II	30	49	55	19	22	24
	> Alg I, Geom, Alg II	40	60	67	24	27	28

Table A-4 (cont.)

Characteristic	Level/value	Four-year students (bachelor's degree)			Two-year students (associate's degree)		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
HS science course sequence	Bio	23	42	48	18	21	22
	Bio & Chem	36	56	63	21	24	25
	Bio, Chem, & Phys	38	59	66	23	26	28
HSGPA	< 3.00	15	32	39	13	16	17
	3.00 to 3.49	29	52	59	22	25	27
	> = 3.50	48	69	75	31	34	36

Note. Bachelor's degree completion rates for four-year students and associate's degree completion rates for two-year students. HS = high school; Alg = Algebra; Geom = Geometry; Bio = Biology; Chem = Chemistry; Phys = Physics; HSGPA = high school grade point average.

Table A-5

Estimated Intercepts and Slopes from Degree Completion Models Using ACT Composite Score as the Predictor by Degree Type and Year for Two- and Four-Year Students

Degree type	Year	Estimated coefficient Intercept	Slope
Bachelor's degree (4-year students)	4	-3.80	0.14
	5	-2.67	0.13
	6	-2.29	0.13
Associate's degree (2-year students)	4	-2.84	0.07
	5	-2.55	0.07
	6	-2.46	0.07
Associate's or bachelor's degree (2-year students)	4	-3.04	0.09
	5	-2.91	0.11
	6	-2.79	0.12

Appendix B

Table B-1

College Enrollment Rates by EXPLORE, PLAN, and Combined EXPLORE/PLAN Benchmark Attainment for EPA-Tested Students

Predictor	Level/value	Enrollment rate
EXPLORE Benchmark attainment (grade 8)		
English	Not met	60
	Met	71
Mathematics	Not met	65
	Met	74
Reading	Not met	63
	Met	73
Science	Not met	67
	Met	77
Number met	0	56
	1	64
	2	70
	3	75
	All 4	76
PLAN Benchmark attainment (grade 10)		
English	Not met	60
	Met	71
Mathematics	Not met	65
	Met	75
Reading	Not met	64
	Met	72
Science	Not met	67
	Met	76
Number met	0	56
	1	64
	2	70
	3	74
	All 4	77

Table B-1 (cont.)

Predictor	Level/value	Enrollment rate
EXPLORE/PLAN Benchmark attainment (grade 8 and grade 10)		
English	Not met/not met	54
	Not met/met	63
	Met/not met	62
	Met/met	72
Mathematics	Not met/not met	63
	Not met/met	72
	Met/not met	71
	Met/met	76
Reading	Not met/not met	60
	Not met/met	68
	Met/not met	69
	Met/met	74
Science	Not met/not met	66
	Not met/met	74
	Met/not met	75
	Met/met	77
Number met	Met 0/met 0	53
	Met 0/met 1-3	59
	Met 0/met 4	67
	Met 1-3/met 0	59
	Met 1-3/met 1-3	70
	Met 1-3/met 4	77
	Met 4/met 0	65
	Met 4/met 1-3	75
	Met 4/met 4	77
Number met (alternative grouping)	Met 0-2/met 0-2	63
	Met 0-2/met 3-4	72
	Met 3-4/met 0-2	72
	Met 3-4/met 3-4	77

Note. EPA = EXPLORE/PLAN/ACT.

Table B-2

College Retention Rates by EXPLORE, PLAN, and Combined EXPLORE/PLAN Benchmark
Attainment for EPA-Tested Two- and Four-Year Students

Benchmark	Level/value	Four-year students (to same institution)			Two-year students (to any institution)		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
EXPLORE Benchmark attainment (grade 8)							
English	Not met	71	54	47	69	52	37
	Met	80	68	63	76	59	49
Mathematics	Not met	75	60	54	72	54	42
	Met	83	72	67	79	65	56
Reading	Not met	75	60	53	70	53	40
	Met	81	70	65	78	62	53
Science	Not met	77	63	57	73	56	44
	Met	84	76	71	82	69	61
Number met	0	69	50	43	66	48	35
	1	74	57	50	71	54	42
	2	78	64	58	76	60	50
	3	82	70	65	80	65	57
	All 4	85	76	72	83	70	65
PLAN Benchmark attainment (grade 10)							
English	Not met	72	54	46	69	53	39
	Met	80	68	63	75	59	48
Mathematics	Not met	75	60	53	72	54	42
	Met	83	72	68	80	67	59
Reading	Not met	75	60	53	70	53	40
	Met	81	70	64	77	62	52
Science	Not met	77	63	57	73	56	44
	Met	84	74	70	82	69	64
Number met	0	68	50	43	67	48	34
	1	73	57	50	71	54	41
	2	78	64	58	76	60	50
	3	82	70	65	79	66	58
	All 4	85	76	72	83	71	66

Table B-2 (cont.)

Benchmark	Level/value	Four-year students (to same institution)			Two-year students (to any institution)		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
EXPLORE/PLAN Benchmark attainment (grade 8 to grade 10)							
English	Not met/not met	66	48	41	66	51	37
	Not met/met	72	56	50	71	53	38
	Met/not met	74	57	49	71	56	44
	Met/met	81	69	64	76	60	50
Mathematics	Not met/not met	73	58	51	71	53	40
	Not met/met	78	66	60	77	64	54
	Met/not met	79	66	59	77	61	51
	Met/met	84	74	69	81	68	60
Reading	Not met/not met	72	56	50	68	51	37
	Not met/met	77	63	56	73	57	44
	Met/not met	78	64	58	74	57	46
	Met/met	82	71	66	79	65	56
Science	Not met/not met	76	61	55	72	55	43
	Not met/met	82	71	66	81	67	61
	Met/not met	82	73	68	79	66	56
	Met/met	85	76	73	83	73	66
Number met	Met 0/met 0	66	47	39	65	46	31
	Met 0/met 1-3	70	53	45	68	51	38
	Met 0/met 4						
	Met 1-3/met 0	70	53	46	70	50	37
	Met 1-3/met 1-3	78	64	58	75	59	49
	Met 1-3/met 4	84	73	68	81	69	63
	Met 4/met 0						
	Met 4/met 1-3	84	74	69	83	69	63
	Met 4/met 4	86	77	74	85	73	69
Number met (alternative grouping)	Met 0-2/met 0-2	74	58	51	71	54	42
	Met 0-2/met 3-4	80	67	61	77	64	56
	Met 3-4/met 0-2	80	68	62	79	63	54
	Met 3-4/met 3-4	84	75	70	82	70	64

Note. Retention rates are to the same institution for four-year students and to any institution for two-year students. Rates are not shown for categories with fewer than 20 students. EPA = EXPLORE/PLAN/ACT.

Table B-3

College Degree Completion Rates by EXPLORE, PLAN, and Combined EXPLORE/PLAN Benchmark Attainment for EPA-Tested Two- and Four-Year Students

Benchmark	Level/value	Four-year students (bachelor's degree)			Two-year students (associate's degree)		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
EXPLORE Benchmark attainment (grade 8)							
English	Not met	19	40	49	15	17	18
	Met	40	60	67	21	23	26
Mathematics	Not met	29	49	57	17	19	21
	Met	44	65	71	24	27	30
Reading	Not met	26	48	56	16	18	20
	Met	42	62	69	23	26	29
Science	Not met	31	53	60	18	20	22
	Met	51	70	76	31	33	37
Number met	0	16	35	43	12	14	15
	1	23	44	52	16	18	20
	2	31	54	61	20	23	25
	3	42	63	70	26	28	32
	All 4	53	71	77	32	35	39
PLAN Benchmark attainment (grade 10)							
English	Not met	18	38	47	14	16	17
	Met	40	60	67	21	24	26
Mathematics	Not met	28	48	56	17	19	22
	Met	45	66	72	27	29	32
Reading	Not met	25	46	54	16	17	19
	Met	42	62	69	23	26	29
Science	Not met	32	52	60	18	20	23
	Met	48	69	75	29	33	36
Number met	0	16	34	42	12	14	15
	1	23	43	52	16	18	20
	2	32	53	61	20	23	25
	3	42	63	70	26	29	32
	All 4	53	72	78	33	35	39

Table B-3 (cont.)

Benchmark	Level/value	Four-year students (bachelor's degree)			Two-year students (associate's degree)		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
EXPLORE/PLAN Benchmark attainment (grade 8 to grade 10)							
English	Not met/not met	13	29	39	13	14	15
	Not met/met	21	43	52	17	19	20
	Met/not met	20	40	49	14	17	19
	Met/met	41	62	68	22	24	27
Mathematics	Not met/not met	24	44	53	16	18	20
	Not met/met	36	58	65	25	27	29
	Met/not met	35	56	63	22	24	27
	Met/met	48	68	74	28	29	33
Reading	Not met/not met	21	40	48	14	15	17
	Not met/met	30	54	62	19	22	24
	Met/not met	30	53	61	19	21	24
	Met/met	45	65	71	25	28	31
Science	Not met/not met	28	49	58	17	19	22
	Not met/met	43	66	71	26	30	33
	Met/not met	47	65	72	28	30	33
	Met/met	54	73	78	36	37	40
Number met	Met 0/met 0	13	30	38	11	12	14
	Met 0/met 1-3	17	38	46	13	15	16
	Met 0/met 4						
	Met 1-3/met 0	19	37	45	13	15	18
	Met 1-3/met 1-3	32	54	61	20	22	25
	Met 1-3/met 4	47	69	74	29	32	34
	Met 4/met 0						
	Met 4/met 1-3	49	68	74	30	33	38
	Met 4/met 4	56	74	80	36	39	43
Number met (alternative grouping)	Met 0-2/met 0-2	23	44	52	16	18	20
	Met 0-2/met 3-4	35	59	66	24	26	28
	Met 3-4/met 0-2	37	56	65	23	26	30
	Met 3-4/met 3-4	50	70	76	31	34	37

Note. Bachelor's degree completion rates for four-year students and associate's degree completion rates for two-year students. Rates are not shown for categories with fewer than 20 students. EPA = EXPLORE/PLAN/ACT.

Table B-4

*Estimated Intercepts and Slopes from Degree Completion Models using EXPLORE or PLAN
Composite Score as the Predictor by Degree Type and Year for EPA-Tested Two- and Four-Year
Students*

| | | Estimated coefficients | | | |
| | | EXPLORE | | PLAN | |
Degree type	Year	Intercept	Slope	Intercept	Slope
Bachelor's degree (4-year students)	4	-4.24	0.21	-4.25	0.19
	5	-2.83	0.18	-3.11	0.17
	6	-2.34	0.17	-2.65	0.17
Associate's degree (2-year students)	4	-3.65	0.14	-4.02	0.15
	5	-3.47	0.14	-3.87	0.15
	6	-3.54	0.15	-3.81	0.15
Associate's or bachelor's degree (2-year students)	4	-3.98	0.17	-4.55	0.19
	5	-3.92	0.19	-4.37	0.20
	6	-3.64	0.20	-3.86	0.19

Note. EPA = EXPLORE/PLAN/ACT.

Appendix C

Table C-1

College Enrollment Rates by Combined EXPLORE/PLAN/ACT Benchmark Attainment for EPA-Tested Students

Benchmark	Level/value	Enrollment rate
English	Not met/not met/not met	52
	Not met/not met/met	69
	Not met/met/not met	57
	Not met/met/met	70
	Met/not met/not met	57
	Met/not met/met	70
	Met/met/not met	61
	Met/met/met	74
Mathematics	Not met/not met/not met	62
	Not met/not met/met	76
	Not met/met/not met	68
	Not met/met/met	77
	Met/not met/not met	68
	Met/not met/met	77
	Met/met/not met	71
	Met/met/met	78
Reading	Not met/not met/not met	58
	Not met/not met/met	69
	Not met/met/not met	64
	Not met/met/met	72
	Met/not met/not met	66
	Met/not met/met	74
	Met/met/not met	69
	Met/met/met	76
Science	Not met/not met/not met	65
	Not met/not met/met	76
	Not met/met/not met	73
	Not met/met/met	78
	Met/not met/not met	72
	Met/not met/met	76
	Met/met/not met	75
	Met/met/met	78

Table C-1 (cont.)

Benchmark	Level/value	Enrollment rate
Number met	Met 0/met 0/met 0	51
	Met 0/met 1-3/met 1-3	67
	Met 1-3/met 1-3/met 0	57
	Met 1-3/met 1-3/met 1-3	72
	Met 1-3/met 1-3/met 4	79
	Met 1-3/met 4/met 4	79
	Met 4/met 4/met 1-3	75
	Met 4/met 4/met 4	78
Number met (alternative grouping)	Met 0-2/met 0-2/met 0-2	62
	Met 0-2/met 0-2/met 3-4	75
	Met 0-2/met 3-4/met 0-2	69
	Met 0-2/met 3-4/met 3-4	76
	Met 3-4/met 0-2/met 0-2	70
	Met 3-4/met 0-2/met 3-4	76
	Met 3-4/met 3-4/met 0-2	72
	Met 3-4/met 3-4/met 3-4	78

Note. Only selected categories are shown for results by combined EXPLORE/PLAN/ACT Benchmark attainment for number met. EPA = EXPLORE/PLAN/ACT.

Table C-2

College Retention Rates by Combined EXPLORE/PLAN/ACT Benchmark Attainment for EPA-Tested Two- and Four-Year Students

Benchmark	Level/value	Four-year students (to same institution)			Two-year students (to any institution)		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
English	Not met/not met/not met	64	45	39	65	50	35
	Not met/not met/met	74	56	49			
	Not met/met/not met	68	50	43	68	52	35
	Not met/met/met	77	61	55	76	58	45
	Met/not met/not met	68	51	44	68	49	38
	Met/not met/met	79	63	56	77	63	52
	Met/met/not met	70	54	46	70	53	40
	Met/met/met	82	70	65	78	62	53
Mathematics	Not met/not met/not met	71	55	48	70	52	38
	Not met/not met/met	81	69	64	81	67	58
	Not met/met/not met	75	59	53	74	59	47
	Not met/met/met	81	71	66	82	71	64
	Met/not met/not met	76	61	54	76	60	49
	Met/not met/met	83	72	66	82	68	59
	Met/met/not met	77	63	57	76	61	51
	Met/met/met	85	76	72	83	71	65
Reading	Not met/not met/not met	71	54	47	68	50	36
	Not met/not met/met	78	66	58	73	56	47
	Not met/met/not met	73	59	53	72	55	40
	Not met/met/met	79	67	60	77	62	51
	Met/not met/not met	75	59	53	72	56	45
	Met/not met/met	80	68	62	76	59	49
	Met/met/not met	77	62	57	76	61	51
	Met/met/met	83	73	68	81	67	58
Science	Not met/not met/not met	75	59	52	72	55	42
	Not met/not met/met	81	70	64	79	64	56
	Not met/met/not met	80	66	62	80	66	60
	Not met/met/met	85	76	70	78	65	61
	Met/not met/not met	80	70	65	79	65	54
	Met/not met/met	83	76	72	84	71	62
	Met/met/not met	82	70	66			
	Met/met/met	86	78	74	82	74	66

Table C-2 (cont.)

Benchmark	Level/value	Four-year students (to same institution)			Two-year students (to any institution)		
		Year 2	Year 3	Year 4	Year 2	Year 3	Year 4
Number met	Met 0/met 0/met 0	65	46	38	65	46	31
	Met 0/met 1-3/met 1-3	73	56	48	71	54	41
	Met 1-3/met 1-3/met 0	69	51	44	69	53	42
	Met 1-3/met 1-3/met 1-3	77	64	57	76	60	50
	Met 1-3/met 1-3/met 4	85	76	70	83	69	61
	Met 1-3/met 4/met 4	86	77	72			
	Met 4/met 4/met 1-3	83	73	69			
	Met 4/met 4/met 4	86	78	75	86	75	71
Number met (alternative grouping)	Met 0-2/met 0-2/met 0-2	72	56	49	71	53	41
	Met 0-2/met 0-2/met 3-4	81	69	62	79	62	51
	Met 0-2/met 3-4/met 0-2	76	61	55	75	62	54
	Met 0-2/met 3-4/met 3-4	83	72	66	81	67	60
	Met 3-4/met 0-2/met 0-2	77	63	57	77	61	52
	Met 3-4/met 0-2/met 3-4	83	73	68	83	67	58
	Met 3-4/met 3-4/met 0-2	79	66	61	79	66	60
	Met 3-4/met 3-4/met 3-4	85	76	72	84	72	66

Note. Retention rates are to the same institution for four-year students and to any institution for two-year students. Only selected categories are shown for results by combined EXPLORE/PLAN/ACT Benchmark attainment for number met. Rates are not shown for categories listed in the table with fewer than 20 students. EPA = EXPLORE/PLAN/ACT.

Table C-3

College Degree Completion Rates by Combined EXPLORE/PLAN/ACT Benchmark Attainment for EPA-Tested Two- and Four-Year Students

Benchmark	Level/value	Four-year students (bachelor's degree)			Two-year students (associate's degree)		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
English	Not met/not met/not met	11	26	35	13	14	16
	Not met/not met/met	21	40	52			
	Not met/met/not met	14	32	42	15	16	18
	Not met/met/met	27	50	59	21	23	24
	Met/not met/not met	14	33	42	13	16	17
	Met/not met/met	28	50	59	19	21	23
	Met/met/not met	17	38	46	15	17	20
	Met/met/met	43	64	70	24	26	29
Mathematics	Not met/not met/not met	21	40	49	15	18	20
	Not met/not met/met	39	63	70	25	27	29
	Not met/met/not met	27	47	56	19	21	24
	Not met/met/met	43	66	72	27	29	31
	Met/not met/not met	29	50	56	18	21	24
	Met/not met/met	42	65	72	27	29	32
	Met/met/not met	33	53	60	21	23	26
	Met/met/met	51	71	77	32	33	37
Reading	Not met/not met/not met	18	36	45	14	15	17
	Not met/not met/met	29	53	59	20	22	23
	Not met/met/not met	24	48	57	16	19	20
	Not met/met/met	35	60	67	23	25	28
	Met/not met/not met	26	45	54	16	18	21
	Met/not met/met	35	58	66	23	25	28
	Met/met/not met	31	53	61	18	22	24
	Met/met/met	47	67	73	28	31	35
Science	Not met/not met/not met	26	47	55	16	19	21
	Not met/not met/met	39	62	68	25	28	30
	Not met/met/not met	37	61	67	24	28	31
	Not met/met/met	48	70	75	29	33	36
	Met/not met/not met	41	61	68	26	27	31
	Met/not met/met	52	69	76	31	32	36
	Met/met/not met	46	67	72			
	Met/met/met	56	74	79	39	41	46

Table C-3 (cont.)

Benchmark	Level/value	Four-year students (bachelor's degree)			Two-year students (associate's degree)		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
Number met	Met 0/met 0/met 0	12	28	36	11	13	14
	Met 0/met 1-3/met 1-3	19	43	51	15	17	18
	Met 1-3/met 1-3/met 0	19	35	44	15	18	19
	Met 1-3/met 1-3/met 1-3	31	53	61	21	23	26
	Met 1-3/met 1-3/met 4	47	70	76	30	31	35
	Met 1-3/met 4/met 4	51	73	79			
	Met 4/met 4/met 1-3	50	68	75			
	Met 4/met 4/met 4	57	75	81	38	40	45
Number met (alternative grouping)	Met 0-2/met 0-2/met 0-2	22	42	50	15	18	19
	Met 0-2/met 0-2/met 3-4	34	60	67	23	24	28
	Met 0-2/met 3-4/met 0-2	29	51	59	21	25	26
	Met 0-2/met 3-4/met 3-4	41	66	72	28	29	32
	Met 3-4/met 0-2/met 0-2	32	51	59	22	25	28
	Met 3-4/met 0-2/met 3-4	44	65	72	28	30	35
	Met 3-4/met 3-4/met 0-2	38	57	65	26	30	32
	Met 3-4/met 3-4/met 3-4	52	72	78	33	36	40

Note. Bachelor's degree completion rates for four-year students and associate's degree completion rates for two-year students. Only selected categories are shown for results by combined EXPLORE/PLAN/ACT Benchmark attainment for number met. Rates are not shown for categories listed in table with fewer than 20 students. EPA = EXPLORE/PLAN/ACT.

Appendix D

Table D-1

Estimated Intercept and Slope for Composite Score from Degree Completion Models for ACT-Tested and EPA-Tested High School Graduates by Year

Predictor	Year	Bachelor's degree		Associate's or bachelor's degree	
		Intercept	Slope	Intercept	Slope
ACT-tested high school graduates					
ACT Composite score	4	-6.12	0.21	-4.62	0.16
	5	-5.01	0.20	-4.08	0.17
	6	-4.57	0.20	-3.78	0.17
EPA-tested high school graduates					
EXPLORE Composite score	4	-6.65	0.30	-5.10	0.24
	5	-5.41	0.28	-4.46	0.24
	6	-4.94	0.27	-4.11	0.24
PLAN Composite score	4	-6.65	0.27	-5.17	0.22
	5	-5.58	0.26	-4.64	0.22
	6	-5.10	0.25	-4.26	0.22

Note. Analyses are based on a random sample of 27,792 ACT-tested and 6,069 EPA-tested 2003 high school graduates. Sample included immediately enrolled students, delayed enrolled students, and students who did not enroll in college. EPA = EXPLORE/PLAN/ACT.

Table D-2

Estimated College Degree Completion Rates by EXPLORE Benchmark Attainment for EPA-Tested High School Graduates

EXPLORE Benchmark	Level/value	Bachelor's degree			Associate's or bachelor's degree		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
English	Not met	7	16	20	12	22	27
	Met	24	40	45	30	45	51
Mathematics	Not met	13	24	29	19	30	36
	Met	32	49	55	36	54	59
Reading	Not met	11	22	27	17	28	34
	Met	28	44	50	33	49	55
Science	Not met	16	29	34	22	35	41
	Met	40	58	63	44	62	67
Number met	0	5	12	16	10	18	22
	1	9	20	25	15	27	32
	2	17	32	38	23	38	45
	3	28	46	52	34	51	57
	All 4	44	61	66	46	64	69

Note. Analyses are based on a random sample of 6,069 EPA-tested 2003 high school graduates. Sample included immediately enrolled students, delayed enrolled students, and students who did not enroll in college. EPA = EXPLORE/PLAN/ACT.

Table D-3

Estimated College Degree Completion Rates by PLAN Benchmark Attainment for EPA-Tested High School Graduates

PLAN Benchmark	Level/value	Bachelor's degree			Associate's or bachelor's degree		
		Year 4	Year 5	Year 6	Year 4	Year 5	Year 6
English	Not met	6	14	18	11	20	25
	Met	24	40	45	30	45	51
Mathematics	Not met	13	24	29	18	30	36
	Met	33	51	56	38	55	61
Reading	Not met	10	21	26	16	27	33
	Met	27	44	49	33	49	54
Science	Not met	16	29	34	22	35	41
	Met	37	55	60	41	59	64
Number met	0	5	11	15	9	17	21
	1	9	19	24	15	26	32
	2	16	31	37	23	38	44
	3	28	46	52	34	51	57
	All 4	44	62	67	47	64	69

Note. Analyses are based on a random sample of 6,069 EPA-tested 2003 high school graduates. Sample included immediately enrolled students, delayed enrolled students, and students who did not enroll in college. EPA = EXPLORE/PLAN/ACT.