

Access & Equity in Linked Learning

*A Report on Pathway Access and
Academic Outcomes for Traditionally
Underserved Students*

SRI Education[™]

Introduction

Linked Learning is an approach for transforming high schools to prepare all students for college, career, and life. Rejecting the outmoded and usually inequitable separation of students into vocational and academic tracks, Linked Learning works through career-themed pathways that integrate college preparatory academics, rigorous technical training, work-based learning, and supports to help students stay on track. With funding from The James Irvine Foundation, SRI International evaluated this approach in nine school districts across California over the course of seven years.

Linked Learning strives to provide all students—regardless of race, socioeconomic status, gender, prior academic achievement, or special learning needs—with equitable access to and opportunities for full participation in a variety of high-quality career-themed pathways. This emphasis on access and equity is particularly important when implementing an approach like Linked Learning that creates small, choice-based learning communities; research suggests that this type of reform, if executed poorly, can exacerbate inequality by further stratifying students by demographic characteristic or achievement level (Clotfelter, Ladd, & Vigdor, 2013; Frankenberg, Siegel-Hawley, & Wang, 2011).

This brief describes the successes and challenges the districts have experienced in fostering access and equity in Linked Learning pathways, examining five groups of students frequently underserved by traditional schools: students with low prior achievement, English learners, African-American students, Latino students, and female students.¹ Throughout the evaluation and in this brief, we focus on data for these “subgroups” of the total student population. We acknowledge that both access and equity are complex constructs that can be defined in many different ways. For the purposes of this brief, we operationalize access and equity as follows: to evaluate access, we examined districts’ choice and recruitment policies and assessed the degree to which pathways were representative of their districts’ high school student populations; to evaluate equity, we compared academic outcomes for Linked Learning student subgroups with those of similar peers in traditional high school settings.

ABOUT LINKED LEARNING

Linked Learning pathways are organized around industry sector themes and can take the form of stand-alone small schools or academies within larger comprehensive high schools. Ideally, pathway cohorts of students in every grade have their own course section for each of their classes—math, English, social studies, and a career-technical education course—so that teachers can implement integrated cross-discipline projects.

Linked Learning pathways integrate four core components: **rigorous academics** that prepare students to succeed in college; **career-technical education** courses in sequence, emphasizing real-world applications of academic learning; **work-based learning** that provides exposure to real-world workplaces and teaches the professional skills needed to thrive in a career; and **comprehensive support services** to address the individual needs of all students, ensuring equity of access, opportunity, and success.

Certified Linked Learning pathways have successfully undergone an external review process based on established indicators of pathway quality.² Certification indicates that a pathway has attained a certain level of fidelity to the four core Linked Learning components. The student outcomes presented in this brief compare students in certified Linked Learning pathways (representing eight of the participating districts) with similar students in traditional high school programs.

THE LINKED LEARNING DISTRICT INITIATIVE

In 2009, recognizing the challenges for individual schools or pathways trying to redesign the high school experience, The James Irvine Foundation launched the California Linked Learning District Initiative. This demonstration project, implemented in nine California districts, focused on the establishment of district systems to support and sustain multiple Linked Learning pathways. As evaluation partner to this demonstration project, SRI documented the development of these district systems and their role in strengthening Linked Learning pathways and examined outcomes for students. The nine participating districts vary in size and include rural and urban geographies; all had a high proportion of disadvantaged students. This summary is intended to highlight the role of district policies and practices in making pathways accessible to all students and to present districts’ successes and challenges in ensuring access and equity for students in traditionally underserved groups.

PARTICIPATING DISTRICTS

Antioch Unified
Long Beach Unified
Los Angeles Unified
Montebello Unified
Oakland Unified
Pasadena Unified
Porterville Unified
Sacramento City Unified
West Contra Costa Unified

Access

District offices play a critical role in determining student access to Linked Learning pathways because they are responsible for the recruitment and assignment policies whereby students are informed of and enroll in pathways. Student choice of pathway is a fundamental principle of Linked Learning, helping to ensure that pathway career themes are relevant to students' interests. Enacting this principle requires an open high school choice system that allows all students to select pathways from all schools in their district. In many district contexts, however, open-choice policies alone will be insufficient to achieve pathway enrollments representative of the overall student population. Research indicates that low-income and minority students generally choose their neighborhood schools because of convenience, tradition, a desire to be with other students with similar backgrounds, and lack of transportation to other district public schools. This evidence implies that absent any other intervention, school enrollment based purely on student choice will reflect patterns of residential segregation (Makris, 2015; Nathanson, Corcoran, & Baker-Smith, 2013; Saporito & Lareau, 1999; Weiher & Tedin, 2002).

The early experiences of the demonstration districts illustrate the challenge of achieving demographically representative pathway enrollments in choice-based systems. Complex interactions between district policies and practices, pathway themes, location, reputation, and residential patterns meant that each student group we examined was underrepresented or overrepresented in certified pathways in at least one district.³

In some cases, students self-segregated by pathway career theme and academic reputation. For example, disproportionately high numbers of male students enrolled in Engineering pathways across the initiative, whereas disproportionately high numbers of female students enrolled in Health pathways. These findings underscore the complexity of student choice and the importance of attention to pathway accessibility.

NO STUDENT GROUP WAS PROPORTIONALLY REPRESENTED IN CERTIFIED PATHWAYS IN ALL DEMONSTRATION DISTRICTS.

STUDENT GROUP REPRESENTATION IN PATHWAYS

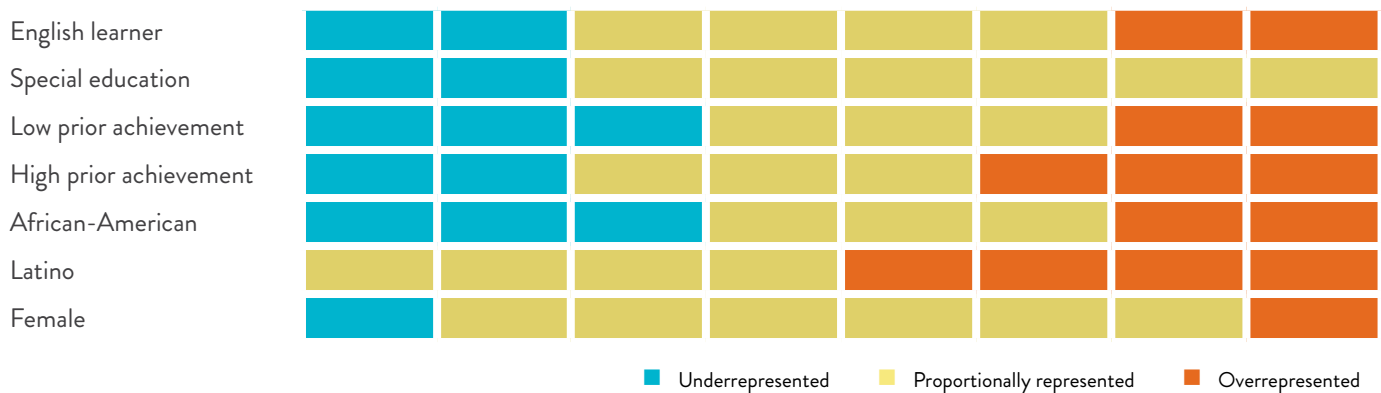


Exhibit reads: English learners were underrepresented in pathways in two demonstration districts, proportionally represented in pathways in four districts, and overrepresented in pathways in two districts.

Note: Each block represents one demonstration district—shading indicates subgroup representation in certified pathways relative to the district's overall population. We considered a given student group to be proportionally represented in pathways if it was within 5 percentage points of the group's district average. Montebello Unified School District is not included in this graphic as it does not have any certified Linked Learning pathways.

To achieve representative pathway enrollments, districts found they needed to go beyond instituting open-choice policies and actively work to reduce the barriers that students from diverse backgrounds confront when making school choices. Strategies that the demonstration districts implemented included the following:

- **Required, open-choice selection.** The most accessible pathway enrollment system is an open-choice policy where all eighth-graders are required to select a high school program from options that include most or all pathways in the district. For a choice system to be truly open, districts cannot implement pathway entrance criteria based on student academic performance and should use randomized procedures such as a lottery for assigning students to oversubscribed pathways.
- **Pathway location and transportation.** Districts can also take steps to reduce the logistical barriers that disadvantaged students face in choosing a pathway outside their neighborhoods. Districts can either strategically locate pathways across the district or provide transportation.
- **Centralized outreach and recruitment.** In any choice system, access to information is an important determinant of equity. Recruitment efforts can encourage students to think broadly about career options and to consider opportunities beyond their neighborhood school. Centralizing outreach and recruitment at the district level ensures a level of consistency in awareness of pathway options across the district. Districts can also help ensure that pathways are academically rigorous and cultivate a reputation for preparing students for both college and career so they do not become seen as purely vocational programs that are unattractive to high-achieving students.
- **Supports to help all students succeed in pathways.** English learners, special education students, and students with low prior achievement need tailored student supports to succeed. Ensuring that pathways provide these supports determines whether they are genuine options for all students.



Equity

To achieve equity, districts must not only afford access to pathways and ensure that they are representative of overall district demographics, but must also prepare all students equally well for college and career. As a first step to attaining equitable outcomes, pathways need to outperform their traditional high school counterparts in educating historically underserved students. Thus to evaluate equity, we compared academic outcomes for Linked Learning student subgroups with those of similar peers in traditional high school settings.

Overall, students in certified pathways outperformed similar peers in traditional high schools. Evaluating equity requires looking beyond these total effects, however, because participation in a pathway may not be equally effective for all students. Ethically, it is important to verify that the overall positive or neutral effects of pathway participation are not masking negative effects for specific student subgroups.

Theoretically, subgroup results may not mirror overall results for two reasons. First, pathway enrollment may differentially affect students in subgroups. This differential impact can be either positive or negative, depending on the subgroup. For example, the literature suggests that pathways' prescribed courses of study may be particularly beneficial for disadvantaged students who otherwise might find themselves tracked into lower level classes in a traditional high school (Fowler & Walberg, 1991; Howley & Howley, 2004; Lee & Smith, 1997; McMillen, 2004). On the other hand, students who need specialized supports may not thrive in pathways that are unable to offer these supports.

The second reason that subgroup results may not mirror overall results is that if subgroup students are clustered in certain pathways, any estimated impacts for the subgroups may also reflect the quality of the pathways serving these students. If students in disadvantaged subgroups are more likely to select lower quality pathways, for example, they could systematically receive lower quality instruction than they would in a traditional high school setting. To address these two concerns, we analyzed the impacts of pathway participation for all five student subgroups of interest.⁴

SUMMARY OF STATISTICAL SIGNIFICANCE AND DIRECTION BY SUBGROUP

	OVERALL	LOW PRIOR ACHIEVEMENT	ENGLISH LEARNER	AFRICAN-AMERICAN	LATINO	FEMALE
STUDENT ENGAGEMENT						
Dropout*	▲	▲	▲	○	▲	▲
STUDENT SUCCESS						
Credits earned	▲	▲	▲	▲	▲	▲
Graduation	▲	▲	○	○	▲	▲
COLLEGE READINESS						
Number of college preparatory requirements	▲	▲	▲	△	▲	▲
Completion of college preparatory requirements	○	RESULT COULD NOT BE ESTIMATED	○	○	○	○
College preparatory GPA	○	△	○	○	△	○
Postsecondary enrollment	○	○	▽	○	○	○
4-year college enrollment		▲	△	▲	○	○
Postsecondary persistence**	○	○	RESULT COULD NOT BE ESTIMATED	○	○	○

* A positive finding for dropout means that students were less likely to drop out.

** Persistence from the first to second year in postsecondary education.

▲ Statistically significant and positive finding at the $p < .05$ level

△ Marginally significant and positive finding at the $p < .10$ level

○ Null finding

▽ Marginally significant and negative finding at the $p < .10$ level

Findings confirmed that student subgroup results largely followed the overall trend of positive or neutral results. We found that the Linked Learning approach had a strong positive impact on the students who entered high school with poor academic skills. This is consistent with the thesis that pathways' prescribed course of study may be particularly beneficial for disadvantaged students who otherwise might find themselves tracked into lower level classes and who may find the real-world relevance and smaller community provided by a certified pathway key to thriving in school. Similarly, African-American students and those with low prior achievement in certified pathways—groups that are traditionally underrepresented in higher education—may have enrolled in 4-year colleges more frequently than their peers because of the additional support offered by the pathways' small learning communities. Given the greater complexities and challenges of enrolling in a 4-year college than a 2-year college, the additional supports from teachers, guidance counselors, and pathway staff may have been especially helpful to students who otherwise might have opted for a 2-year institution. Linked Learning is not only beneficial for low-achieving students; we found that students with high prior achievement performed equally well in pathways as their peers in traditional high school programs.

On the other hand, these findings suggest that English learner students in certified pathways may be enrolling in postsecondary institutions at lower rates than their traditional high school counterparts, although this result was estimated imprecisely enough that it may have arisen by chance. Moreover, because of the small number of English learner students who persisted in a postsecondary institution, we were unable to estimate any differences on this outcome, a technical barrier that points to the challenge of keeping these students in college. These findings suggest that the postsecondary transition may be a particular point of concern for English learners.

The following one-page summaries examine both access and equity results for each traditionally underserved group.

- *Students with low prior achievement*
- *English learners*
- *African-American students*
- *Latino students*
- *Female students*



Students with Low Prior Achievement

For Linked Learning to reduce the achievement gap, its impacts must be experienced most dramatically by students with low prior achievement. We defined low prior achievement as students receiving a *below basic* or *far below basic* proficiency designation on the English Language Arts California Standards Test before entering the pathway or traditional high school program. Approximately one quarter of students in the sample met this definition upon entering high school.

ACCESS

Students with low prior achievement made up approximately one third of the overall sample in Los Angeles, Oakland, and West Contra Costa.

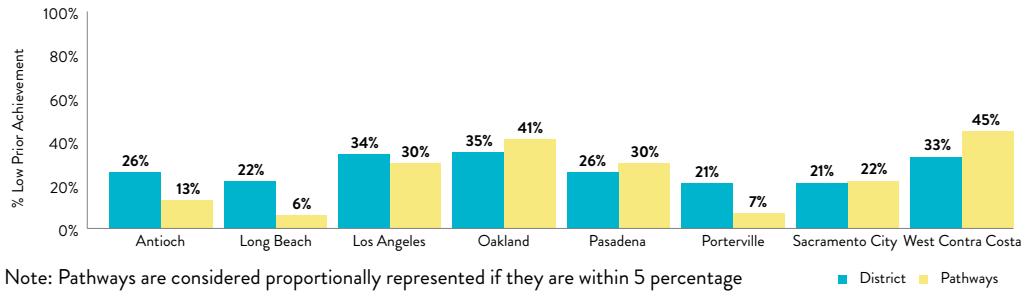
Three demonstration districts—Los Angeles, Pasadena, and Sacramento City—enrolled students with low prior achievement in certified pathways at representative rates. Of the remaining districts, three underenrolled students with low prior achievement and two overenrolled students with low prior achievement.

Across districts, students with low prior achievement enrolled in Arts and Media pathways at representative rates, but were slightly underrepresented in Engineering and Health Science pathways.⁵

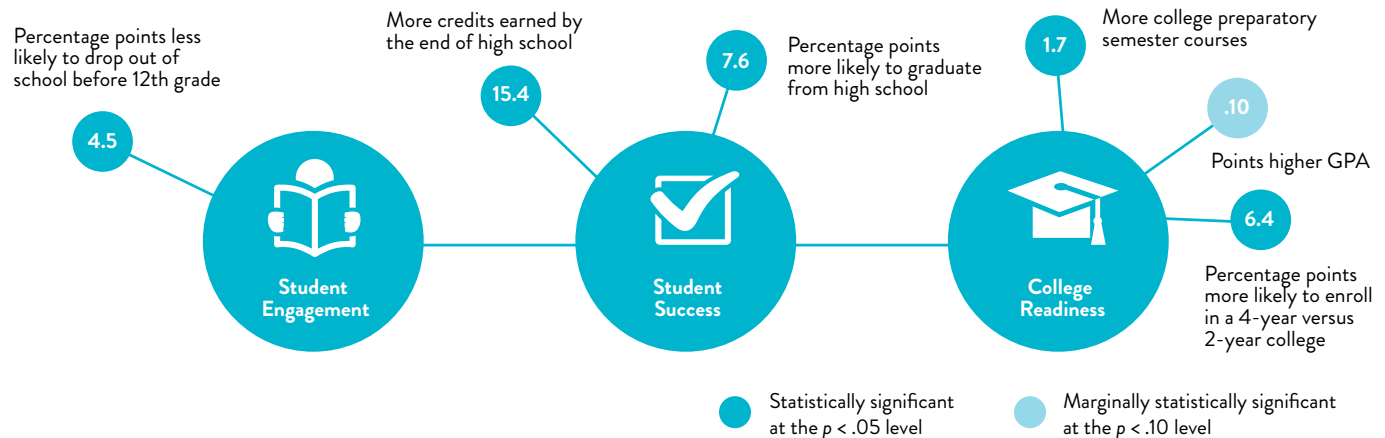
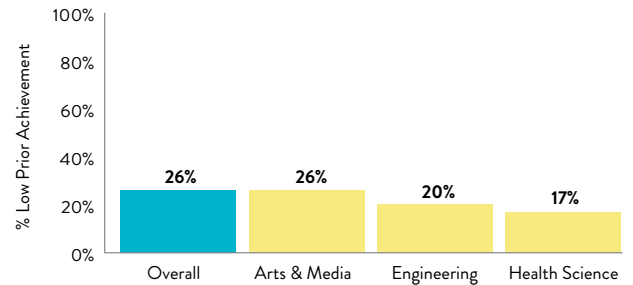
EQUITY

Participation in a Linked Learning pathway had strong positive effects on students entering with low prior achievement. On average, certified pathway students with low prior achievement were less likely to drop out and more likely to graduate from high school than similar peers in traditional high schools. Further, these students accumulated more credits and college preparatory requirements than similar peers in traditional high school programs. They also had slightly higher GPAs than similar peers, but these results were estimated imprecisely enough that they may have arisen by chance. Although students with low prior achievement in certified pathways were equally likely to enroll in a postsecondary institution as their similar peers, when they did enroll in a college they were more likely to enroll in a 4-year institution. However, these students were no more likely to persist in college than their peers from traditional high schools. On the whole, the sizes of these differences indicates that participation in a certified pathway had a meaningful impact on outcomes for students with low prior achievement.

ENROLLMENT OF STUDENTS WITH LOW PRIOR ACHIEVEMENT OVERALL AND IN PATHWAYS, BY DISTRICT



LOW PRIOR ACHIEVEMENT ENROLLMENT BY PATHWAY THEME



English Learners

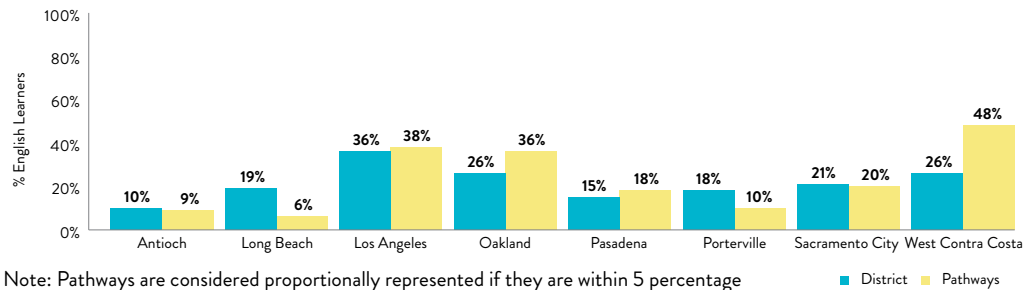
Scheduling English learners in the full pathway course sequence can be a challenge, given the additional curricular demands on these students (e.g., English language development support) that potentially limit the extent to which they can fully engage with the Linked Learning approach. For the purposes of these analyses, we classified students as English learners on the basis of their eighth-grade designation. English learners constituted approximately 21% of the analytic sample.

ACCESS

English learners made up more than one quarter of the overall sample in Los Angeles, Oakland, and West Contra Costa.

Four demonstration districts—Antioch, Los Angeles, Pasadena, and Sacramento City—enrolled English learners at representative rates. Of the remaining districts, two underenrolled English learners and two overenrolled English learners. Across districts, English learners were underrepresented in Engineering pathways.

ENROLLMENT OF ENGLISH LEARNERS OVERALL AND IN PATHWAYS, BY DISTRICT

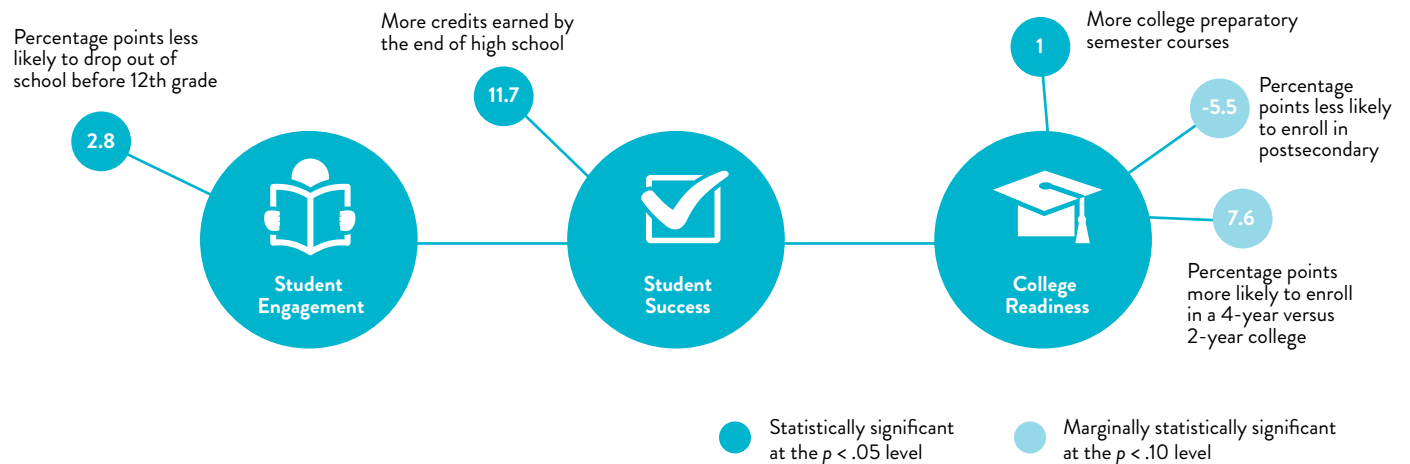
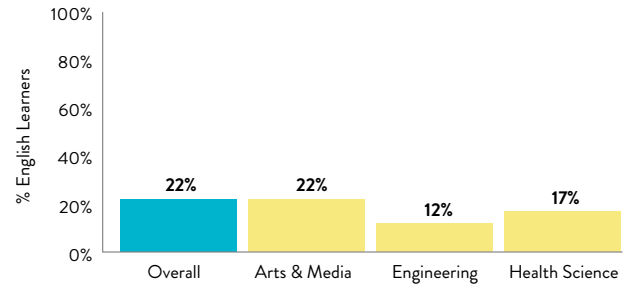


Note: Pathways are considered proportionally represented if they are within 5 percentage points of the district average for a given student subgroup.

EQUITY

On average, English learner students in certified pathways earned more credits—equivalent to more than two additional courses—and completed one more college prep requirement than similar peers in traditional high school programs. They were also less likely to drop out before 12th grade. English learners were less likely than their peers in traditional high school programs to enroll in college but more likely to enroll in a 4-year college if they did—however, both these postsecondary results were estimated imprecisely enough that they may have arisen by chance. Because of the small number of English learner students who persisted in a postsecondary institution, we were unable to estimate any differences on this outcome, a technical barrier that points to the challenge of keeping these students in college. We found no other observable effects of pathway participation on student outcomes for English learners in certified pathways.

ENGLISH LEARNER ENROLLMENT BY PATHWAY THEME



African-American Students

Given that Linked Learning aims to increase equity by graduating college- and career-ready students, it is of particular importance that this initiative serves African-American students, who face the lowest high school graduation rates in California (California Department of Education, 2016). African-American students comprised approximately 15% of the overall sample.

ACCESS

African-American students constituted more than a quarter of the sample in Oakland and Antioch, and less than 5% of the sample in Los Angeles and Porterville.

Of the six demonstration districts with African-American student populations of greater than 5%, only Long Beach enrolled African-American students at a representative rate. Of the remaining districts, three underenrolled African-American students and two overenrolled African-American students.

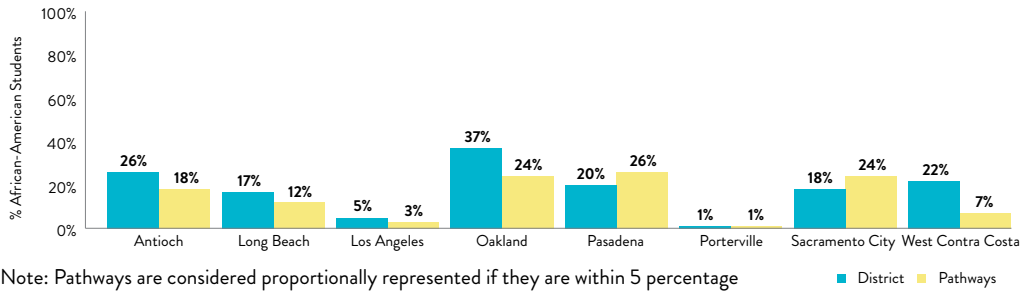
Across districts, African-American students were proportionally represented in Arts and Media, Engineering, and Health Science pathways.

EQUITY

We observed few effects of pathway participation on outcomes for African-American students. On average, African-American students in certified pathways earned more credits—roughly three courses worth—than African-American students in traditional high school programs. They also accumulated one more college prep requirement, but these results were estimated imprecisely enough that they may have arisen by chance.

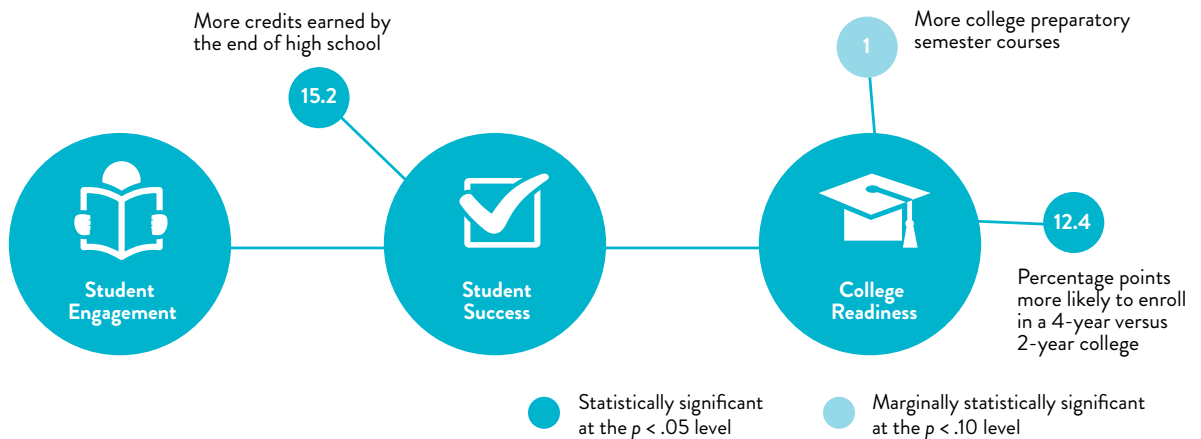
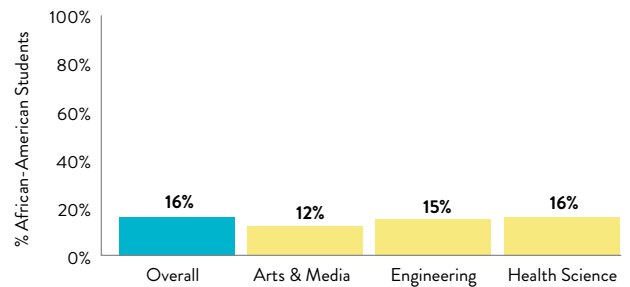
We found that African-American students in certified pathways were equally likely to enroll and persist in a postsecondary institution as similar students who attended traditional high schools, but those who did enroll in a postsecondary institution were 12.4 percentage points more likely to enroll in a 4-year college than their peers. There were no other observable effects of certified pathway participation on outcomes for African-American students.

ENROLLMENT OF AFRICAN-AMERICAN STUDENTS OVERALL AND IN PATHWAYS, BY DISTRICT



Note: Pathways are considered proportionally represented if they are within 5 percentage points of the district average for a given student subgroup.

AFRICAN-AMERICAN ENROLLMENT BY PATHWAY THEME



Latino Students

Latino students compose the largest racial or ethnic group in the nine initiative districts. Latino students in the class of 2015 in California were 9.5 percentage points less likely than their white classmates to graduate with their cohort (California Department of Education, 2016). Latino students represented 58% of students in the sample. Approximately one third of the Latino sample was classified as English learners.

ACCESS

Latino students made up more than a third of the overall sample in each of the districts, and more than half the sample in Los Angeles, Long Beach, Pasadena, and Porterville.

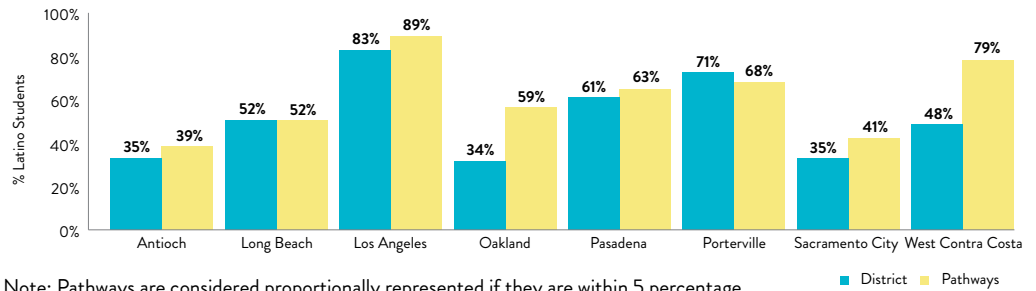
Five demonstration districts—Antioch, Long Beach, Los Angeles, Pasadena, and Porterville—enrolled Latino students at representative rates. The three remaining districts all overenrolled Latino students.

Across districts, Latino students were slightly overrepresented in Arts and Media pathways and slightly underrepresented in Health Science pathways.

EQUITY

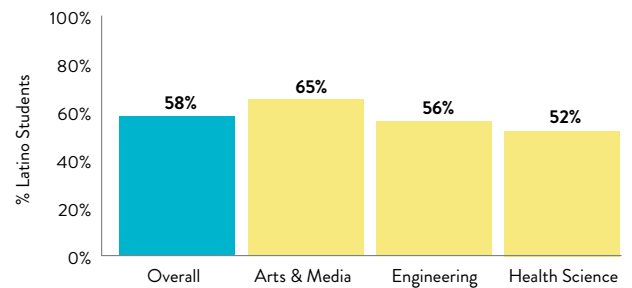
Findings for Latino students in certified pathways mirrored the findings from the overall student sample—most likely because Latino students constituted the majority of the sample. On average, Latino students in certified pathways were less likely to drop out and more likely to graduate than similar peers. They also earned more credits and accumulated slightly more college preparatory requirements than their counterparts in traditional high schools. Latino students in certified pathways had GPAs that were 0.09 point higher than those of similar peers, but these results were estimated imprecisely enough that they may have arisen by chance. As in the overall sample, there were no impacts on college attendance for Latino students in certified pathways.

ENROLLMENT OF LATINO STUDENTS OVERALL AND IN PATHWAYS, BY DISTRICT

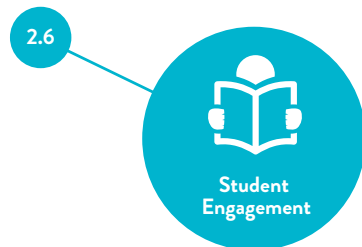


Note: Pathways are considered proportionally represented if they are within 5 percentage points of the district average for a given student subgroup.

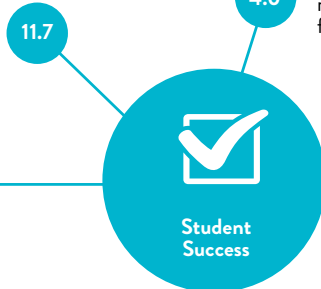
LATINO ENROLLMENT BY PATHWAY THEME



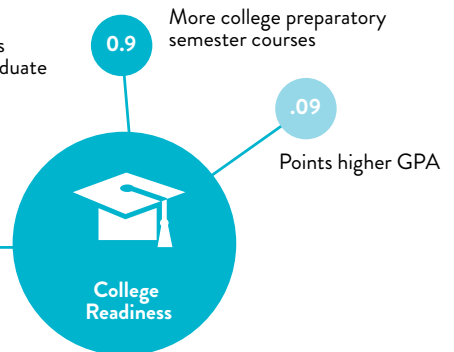
Percentage points less likely to drop out of school before 12th grade



More credits earned by the end of high school



Percentage points more likely to graduate from high school



● Statistically significant at the $p < .05$ level

● Marginally statistically significant at the $p < .10$ level

Female Students

Female students are more successful in navigating high school than males; in California they are nearly 8 percentage points more likely to graduate⁶; nationally, they are nearly 6 percentage points more likely to enroll in college.⁷ However, they are less likely to earn a degree in a science, technology, engineering, and mathematics (STEM) related field. Nationally, women earn 31% of postsecondary degrees and certificates in STEM (U.S. Department of Education, 2016b). Females made up half of the sample overall.

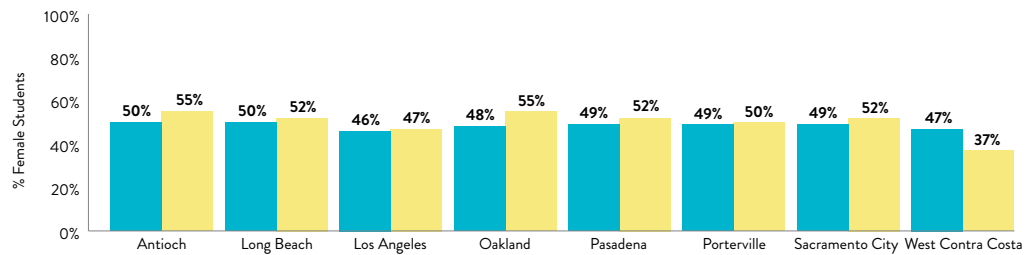
ACCESS

Female students made up slightly less than half of the sample in six of the districts and exactly half the sample in Antioch and Long Beach.

Six demonstration districts—Antioch, Long Beach, Los Angeles, Pasadena, Porterville, and Sacramento City—enrolled female students at representative rates. Of the two remaining districts, Oakland overenrolled female students in pathways and West Contra Costa underenrolled female students in pathways.

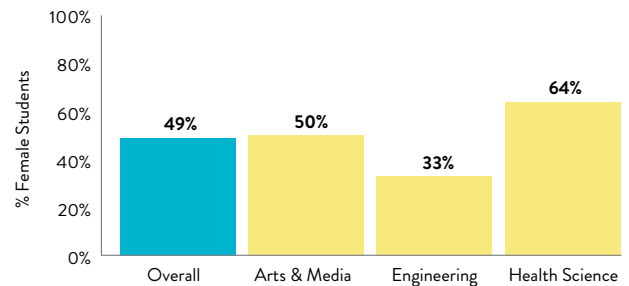
Across districts, female students were enrolled in Arts and Media pathways at representative rates but were substantially underrepresented in Engineering pathways and overrepresented in Health Science pathways.

ENROLLMENT OF FEMALE STUDENTS OVERALL AND IN PATHWAYS, BY DISTRICT



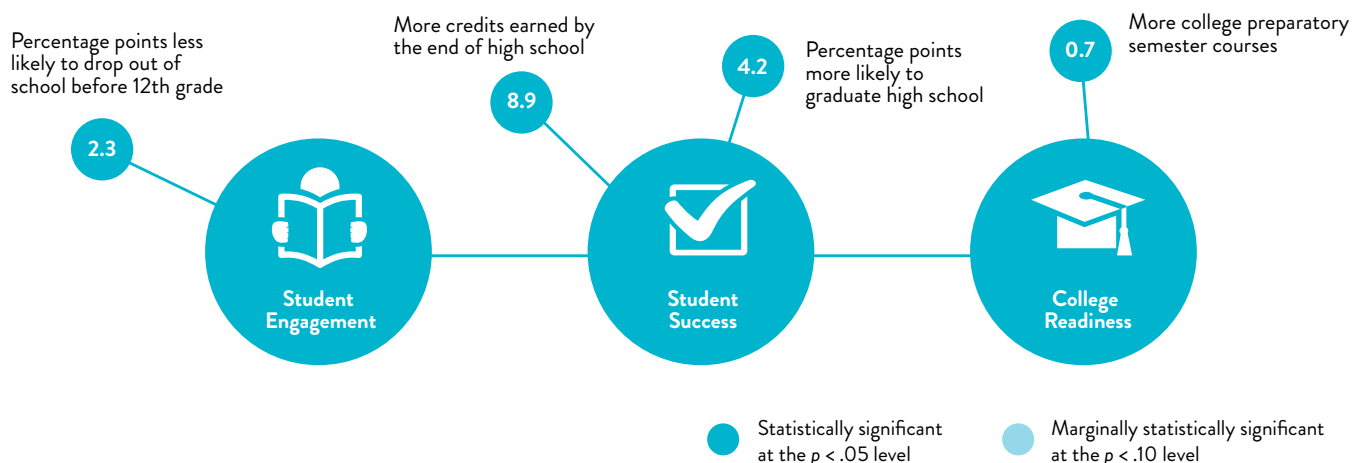
Note: Pathways are considered proportionally represented if they are within 5 percentage points of the district average for a given student subgroup.

FEMALE ENROLLMENT BY PATHWAY THEME



EQUITY

Findings for female students mirrored overall results—most likely because female students constituted half of all students in the sample and were evenly distributed across districts. On average, female students in certified pathways were less likely to drop out, more likely to graduate, and accumulated more credits and slightly more a–g requirements than female students in traditional high schools. Female students in certified pathways earned similar GPAs and enrolled in postsecondary institutions at similar rates as their counterparts in traditional high schools. Given that female students exhibited different enrollment patterns by pathway theme than their male peers, the fact that these results mirror those of the overall population provides evidence that neither gender nor pathway theme interferes with the positive benefits of pathway participation.



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Endnotes

- ¹ Although both special education students and students with low socioeconomic status are also of interest, we chose not to run separate analyses for either group. Special education students constituted 8% of our analytic sample, a sample size too small to conduct a separate analysis using the same methods as in the overall analysis. Students with low socioeconomic status accounted for a majority of our sample (79%), so results closely mirrored those of the overall sample. Although female students are more successful than males on average in navigating high school, we included them in these analyses because they are less likely to earn a degree in a science, technology, engineering, and mathematics (STEM) related field. Nationally, women earn 31% of postsecondary degrees and certificates in STEM (U.S. Department of Education, 2016b).
- ² ConnectEd: The California Center for College and Career, established by The James Irvine Foundation in 2006, served as the primary intermediary and technical assistance provider for the demonstration project. The National Academy Foundation provides technical assistance, professional development, and curriculum to a national network of academies in five industry sectors: finance, hospitality and tourism, information technology, engineering, and health science.
- ³ Enrollment analysis was based on ninth- or tenth-grade enrollment data from early years of the initiative (through 2011–12); thus, these trends do not reflect later efforts by demonstration districts to ensure access.
- ⁴ We used statistical controls to compare outcomes for certified and noncertified pathway students with those of students who attended traditional high schools, had similar demographic characteristics and prior achievement, and were enrolled in the same district. We determined enrollment on the basis of students' initial pathway choice in ninth or tenth grade, depending on the initial grade level served by the pathway. If students subsequently left the pathway or switched to a different academic program, they remained classified on the basis of their initial enrollment. This approach ensured that any positive findings for pathways were not the result of these programs culling struggling students. For more information on the data and methods used in these analyses, see the full evaluation report, [Taking Stock of the California Linked Learning District Initiative: Seventh-Year Evaluation Report](#).
- ⁵ Across the nine demonstration districts, certified Linked Learning pathways represented a variety of industry sectors including arts and media, engineering, health science, public services, finance and business, and education. However, we restricted our analyses to the three industry sectors represented in a majority of the demonstration districts: arts and media, engineering, and health science.
- ⁶ Female students in the class of 2015 in California were 7.5 percentage points more likely than their male classmates to graduate with their cohort (California Department of Education, n.d.).
- ⁷ Women ages 18–24 were 5.5 percentage points more likely than men in the same age group to be enrolled in a postsecondary institution in 2014 (U.S. Department of Education, 2016).

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