SRI INTERNATIONAL

Taking Stock of the California Linked Learning District Initiative

Sixth-Year Evaluation Report

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Executive Summary

Since 2006, The James Irvine Foundation has invested more than $100 million in Linked Learning, a promising approach to transforming education in California. In 2009, the Foundation launched the California Linked Learning District Initiative (the initiative) to demonstrate this approach in nine districts. The multiyear evaluation of this large initiative has a twofold purpose: to document the work and distill lessons from districts that are applying Linked Learning systemically and to measure the effect of this comprehensive implementation on student outcomes.

SRI International's sixth annual evaluation report captures a transitional moment, 2014–15 having marked the final year of the Foundation's funding for the initiative; over the past few years the Foundation has been shifting from a district-focused strategy to a regional approach for advancing and scaling Linked Learning. This period also ushered in unprecedented state and federal funding supporting the development of regional partnerships for the expansion and improvement of career pathway programs. Most notably, the California Career Pathway Trust (CCPT) grants awarded in 2014 and 2015 constituted a significant increase in the resources available for the nine initiative districts. These grants provided funds to develop regional infrastructures for increasing student access to high-quality work-based learning opportunities and to smooth educational transitions for students by aligning and articulating career-themed pathways with community colleges.

About Linked Learning

The Linked Learning approach integrates rigorous academics that meet college-ready standards with sequenced, high-quality career-technical education, work-based learning, and supports to help students stay on track. Linked Learning pathways are organized around industry-sector themes. Ideally, the industry theme is woven into lessons taught by teachers who collaborate across subject areas with input from working professionals, and reinforced by work-based learning with real employers. This approach is designed to make learning more like the real world of work, and help students answer the question, "Why do I need to know this?"

It is within this context of increased funding for regional expansion of Linked Learning that we present this sixth-year evaluation report. Previous evaluation reports focused on the development of district systems to support new and existing Linked Learning pathways and on the student experience. As we close the sixth year of our evaluation, we turn our primary attention to the following questions: What effect does participation in a Linked Learning pathway have on students' likelihood of graduating from high school and their college eligibility? Are pathways improving outcomes for all student subgroups? What is the status of Linked Learning pathway quality and sustainability in the nine districts? And how are the regional expansion efforts affecting Linked Learning implementation in the initiative districts?

To answer these questions, this report offers findings for the first time on student high school graduation and college eligibility, both overall and for subgroups of students. We also examine districts' progress in expanding pathway access and ensuring equity, looking at patterns in student enrollment and persistence in pathways. Finally, we examine the influence of regional expansion efforts on districts' progress in developing work-based learning systems, their relationships with postsecondary institutions, and their plans for expanding and sustaining Linked Learning while maintaining pathway quality and fidelity to the Linked Learning approach. Lessons from the experiences of the nine initiative districts are highly instructive for new regional collaborations that are just beginning to engage with or scale up Linked Learning.

Student Outcomes

A central goal of the initiative is to increase student engagement in school and ultimately improve high school graduation rates and increase successful transitions to a full range of postsecondary education opportunities, particularly for low-income and disadvantaged youth. In this sixth-year report, we were able to track a cohort of students in all nine districts from enrollment in a Linked Learning pathway through high school graduation for the first time using data from the class of 2014. In the coming year, we will update this analysis to include the class of 2015 as well.[1] We examined end-of-high-school outcomes—with an emphasis on graduation and indicators of college eligibility—to assess the impact Linked Learning had on students throughout their high school careers and compared outcomes for students in Linked Learning certified pathways and similar peers enrolled in traditional high school programs in each district.[2] We first present student outcomes for certified pathways, those that have successfully undergone external review by ConnectEd or the National Academy Foundation based on indicators of pathway quality defined by each organization.[3]

Estimating the Effects of Linked Learning on Students

To examine student enrollment and retention patterns within pathways, as well as outcomes for students in certified pathways compared with similar peers in traditional high school programs, we used student-level demographic and achievement data from the districts. For the analysis of student outcomes, we assigned students their pathway status on the basis of the academic program in which they enrolled in the ninth or 10th grade, whichever was the lowest grade level served by the pathway. When we examined course-related outcomes, we excluded dropouts to disentangle the effects of Linked Learning on dropping out from any effects it has on outcomes that can be measured only for students who remained in school.

High School Graduation

The Linked Learning approach did make a difference for high school students, leading to more credits, decreased dropout rates, and higher graduation rates for students—although the results held only for certified pathways. These findings build on and reinforce the strongest and most consistent findings from our earlier evaluations, which indicated that certified pathway students completed more credits and remained in their district longer than similar students in traditional high school programs.

To successfully graduate from high school in California, students must be engaged enough to remain in school for 4 years, earn 220 credits (equivalent to 44 courses), and pass the California High School Exit Exam (CAHSEE).[4] We found the following:

- On average, students who enrolled in certified pathways accumulated 13.3 more credits than similar peers in traditional high school programs—equivalent to 2.6 more courses or approximately one-half of a semester of coursework over the 4 years of high school.[5]

On average, certified pathway students completed 13.3 more credits—or 2.6 more courses—than similar students in traditional high school programs

[1] Outcomes findings for students in certified pathways are based on data available from eight of the nine districts in the initiative. One district did not have certified pathways at the time of analysis. We estimated the results across districts, rather than separately for each individual district.

[2] We planned to report on postsecondary enrollment results for the first cohort of Linked Learning graduates in the four early implementing districts, but because of challenges in obtaining data from a sufficient number of districts, we will present these results in the seventh-year report, when we expect to have better data coverage.

[3] See the appendix for details on the classification of high school programs.

[4] Because students take CAHSEE for the first time in 10th grade, we presented results for the student cohorts included in this evaluation in the fifth-year report. Certified pathway students outscored similar peers at traditional high schools by a small amount on the English language arts CAHSEE exam (but not on the Math exam).

- On average, students in certified pathways were 1.9 percentage points less likely to drop out of high school and 3.7 percentage points more likely to earn a high school diploma than similar students in traditional high school programs.

On average, certified pathway students were 1.9 percentage points less likely to drop out and 3.7 percentage points more likely to graduate from high school compared with similar students in traditional high school programs.

Increasing the graduation rate of pathway students is a critical initiative accomplishment given recent national trend data indicating that high school graduates earn approximately 60% more than high school dropouts (U.S. Census Bureau, 2009).

College Eligibility

Alongside increasing graduation rates, it is also important that Linked Learning graduates be adequately prepared to transition to college or careers. We assessed students' progress toward college eligibility, as measured by a combination of course-taking and test outcomes. These analyses of credits accumulated and a–g completion are based on data from student in six of the nine districts.[6] We found that

- Linked Learning students were equally likely as similar students in traditional high schools to complete college-preparatory course requirements for public 4-year colleges and universities in California (a–g requirements).

It is important to consider that pathway students have the demands of completing a career technical course sequence in addition to the more traditional academic curriculum. We found no evidence that these additional requirements were interfering with pathway students' completion of the a–g requirements. In addition, certified pathways are doing just as well as traditional programs at helping students complete the a–g requirements even as they retain more students who might otherwise have dropped out and are unlikely to pursue the full college preparatory curriculum.[7]

Further, those certified pathway students who do complete all requirements will have any easier time with the postsecondary transition, given higher average college-admission grade point averages (GPAs)—meaning they could be more likely to be eligible for admission at California's public 4-year universities—and greater chances of having passed the English language arts Early Assessment Program (ELA EAP) exam, exempting them from remediation at the majority of California's postsecondary institutions. We found that

On average, certified pathway students had CSU GPAs that were 0.14 points higher than those of similar students in traditional high school programs.

- On average, certified pathway students had California State University (CSU) GPAs that were 0.14 points higher than similar students in traditional high school programs. [8]

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[5] We compared credits accumulated for students who remained in school through grade 12. In prior reports, we typically provided larger estimated differences for each of 9th–11th grades. The difference in size of this year's estimate and prior years' is likely due to the exclusion of students who dropped out before 12th grade.

[6] Students from Antioch, Oakland, and Sacramento are not included in the analyses of credit accumulation or a-g completion.

[7] In the fifth-year report, we reported that certified pathway students in the 10th grade were more likely to be on track to complete a–g requirements than similar peers, but there were no statistically significant differences for students in the 9th and 11th grades. One key difference this year is that we excluded students who dropped out of school when examining a–g completion. Prior findings that students in certified pathways were more likely to be on track to complete a–g requirements may have been driven by the greater likelihood that students in traditional high school dropped out (and thus did not earn a–g credits).

[8] A student's GPA in a–g courses has important implications for college admission to California's 4-year public universities. Students must earn at least a 3.0 GPA to be eligible for the UC system. Students qualify for admission to the CSU system with a GPA of 3.0 or higher and are ineligible for admission with a GPA below 2.0. Our calculation of GPA closely mirrors the CSU system's formula to calculate high school GPA for applicants.

- On average, certified pathway students were 5.3 percentage points more likely to be classified as ready or conditionally ready for college in ELA than similar students in traditional high school programs.

Collectively, these analyses produced limited but positive evidence that certified pathway students are more likely to be college elligible than their peers, but also pointed to areas of growth for the Linked Learning approach: To substantially improve Linked Learning graduates' college eligibility, pathways will need to ensure that students have access to and complete all the required a–g courses. Qualitative data suggest that most pathways provided students with access to some of the a–g approved classes needed to fulfill the course requirement through the pathway program of study. The lack of a–g approved pathway career and technical education (CTE) courses and the lack of a foreign language course remained barriers to pathway students completing 4-year college entrance requirements within their pathway program of study. Districts have been responding to this deficiency by revisiting pathway courses of study and revamping CTE courses to meet a–g standards.

Student Equity and Access

The Linked Learning approach strives to provide all students with equitable access and opportunities for full participation in a variety of high-quality career-themed pathways. To assess equity and access we (1) examined the relationship between district choice and recruitment policies and the degree to which pathways are representative of their district's high school student population; (2) analyzed student persistence in pathways, including students with special learning needs such as special education students and English learners; and (3) compared the academic outcomes for subgroups of students in Linked Learning pathways with similar peers in traditional high school settings.

Enrollment and Persistence

To improve pathway access to all students, some districts are changing their policies to offer wider pathway choice (students can access most or all pathway options in the district) and more centralized recruitment (the district organizes recruitment for all pathways, ensuring a level of consistency). We found that

- Although student preferences complicate the relationship between district policies and pathway enrollment patterns, districts that use districtwide choice and district-driven recruitment practices appear to be better positioned to enroll in pathways a student body reflective of district demographics. The two districts with the most representative populations of students in pathways both centralized their recruitment strategies *and* allowed incoming students open choice of high school pathways and programs.

Because enrolling students in pathways is only the first step in ensuring equitable access, we also examined student persistence in pathways as an indicator of whether pathways are providing students with necessary supports. Our analysis of persistence differed from the dropout analysis because here we explored whether students remained in the *same* certified pathway that they initially enrolled in, whereas in the dropout analysis we examined whether students remained in school at all, regardless of pathway or program. Additionally, these results are purely descriptive so we cannot draw any comparisons to traditional high school programs. We found that

- Over 70% of students who started out in a certified pathway in its lowest grade level were still enrolled in the same pathway by the time they reached 11th grade, but students with low prior achievement, English learners, and special education students had lower than average rates of persistence in certified pathways. In part, these trends for student subgroups are due to scheduling challenges and because it can be difficult for small pathways to meet the needs of students in these subgroups.

Subgroup Academic Outcomes

For our analysis of academic outcomes by student subgroup—African Americans, Latinos, females, English learners, and students with low prior achievement—we examined each outcome presented earlier.[9] We found that

- On average, students with low prior achievement in certified pathways were 4.1 percentage points less likely to drop out, accumulated 21.8 more credits, completed 1.9 more a–g courses, and had GPAs that were 0.16 points higher than similar peers in traditional high school programs.

On average, students with low prior achievement in certified pathways were 4.1 percentage points less likely to drop out, accumulated 21.8 more credits, completed 1.9 more a–g courses, and had GPAs that were 0.16 points higher than similar peers in traditional high school programs.

- On average, English learner students in certified pathways earned 15.2 more credits than similar peers in traditional high school programs. We found no other observable effects of pathway participation on outcomes for English learners.
- On average, African American students in certified pathways earned 29.3 more credits—more than an additional semester's worth—than similar students in traditional high school programs. We found no other observable effects of certified pathway participation on outcomes for African American students.
- Findings for female and Latino students mirrored the overall results for students in certified pathways—most likely because female and Latino students, respectively, account for 50% and 58% of the total student sample.

These results confirmed that the overall positive or neutral effects of pathway participation are not masking negative effects for specific student subgroups. The observed effectiveness of Linked Learning for students entering high school with low academic skills is consistent with the literature, which suggests that pathways' prescribed course of study may be particularly beneficial for disadvantaged students, who might otherwise find themselves tracked into lower level classes in a traditional high school setting (Fowler & Walberg, 1991; Howley & Howley, 2004; Lee & Smith, 1997; McMillen, 2004). These students may also find the real-world relevance and greater structure and supports provided by a certified pathway key to thriving in school.

On the other hand, these findings suggest that African American and English learner students may not experience the full benefits of participating in a certified pathway. Interviews with high school counselors indicated that scheduling conflicts with required language classes often prevented English learners from fully participating in a pathway's course sequence—including the interdisciplinary projects offered across these classes. This obstacle may temper the effect of pathway enrollment on outcomes for these students.

[9] For this analysis, we limited the sample to students in the subgroup of interest. Then we compared outcomes for students in certified and non-certified pathways with those of similar students in the subgroup in traditional high schools. Not all districts and certified pathways are represented in the analyses because student populations varied by district and subgroup. Although both special education and low socioeconomic status students are also of particular interest to this initiative, we chose not to run separate analyses for either group. Special education students constituted 8% of the analytic sample, a sample size was too small to conduct a separate analysis using the same methods as the overall analysis. Low socioeconomic status students were a majority of our sample—79%—so results therefore closely mirror those of the overall sample.

Student Outcomes in Non-certified Pathways

As state, federal, and Foundation funding for regional expansion of Linked Learning encourages the development of new pathways beyond the nine initiative districts, it is important to understand whether the approach must be implemented with fidelity to achieve optimal results. To answer this question, we estimated differences between non-certified pathway students and similar traditional high school students for all outcomes, and also explored patterns of student enrollment and persistence in non-certified pathways. We found that

- Students in noncertified pathways did not experience the positive graduation and college eligibility outcomes observed for certified pathway students. Non-certified pathway students were equally likely to drop out and graduate from high school, completed the same number of credits and college-prep requirements, had comparable college-admission GPAs, and performed as well on the ELA EAP exam as similar students in traditional high school programs.

- In almost all districts, student persistence in certified pathways was higher than in non-certified pathways. The lack of positive findings for students in non-certified pathways may be partially explained by the fact that students were less likely to remain in non-certified pathways through the 11th grade, making them less likely to reap the full benefits of pathways.

Identification of Non-certified Pathways

For this analysis, we included any career-themed pathways identified by districts as "non-certified pathways." Interviews with district staff indicated that pathways in this category covered a wide range of adherence to the Linked Learning approach. Some pathways were themed in name only, whereas others were nearing certification. We believe this wide range of adherence to the Linked Learning approach translates to a wide range in the quality of non-certified pathways within the districts. Our findings may therefore help inform districts debating the value of pathway certification and continuous improvement.

These findings suggest that a career theme alone is inadequate to produce positive effects on student outcomes. Although the certification process itself may not be imperative for pathways to improve student outcomes, certification indicates that pathways have implemented certain structures (e.g., work-based learning systems, course sequencing). When these structures were in place, we observed positive effects of pathway participation on high school graduation and college eligibility.

Pathway Quality and Fidelity

In the sixth year of the initiative, Linked Learning leaders have come to a consensus that a slower pace of pathway development and expansion is desirable and promotes more consistent quality in implementation. Even in districts that are continuing with pathway expansion plans, Linked Learning leaders expressed the desire to slow the pace of implementation and direct more attention to quality assurance in pathway development and implementation. The lack of positive findings for non-certified pathways provides some validation of this focus on quality over rapid expansion.

Through our interviews with Linked Learning staff, we found that

- Several districts set up systems to assess pathway quality to better understand progress toward meeting Linked Learning certification criteria. The most successful used data to provide targeted supports to pathways and emphasized continuous improvement over accountability.
- As districts increase their attention to continuous pathway quality improvement, some are seeing certification as a secondary priority, whereas others continue to place a high value on certification as a marker of quality.

Regional Expansion: Implications for Work-Based Learning and Postsecondary Partnerships

State (CCPT), federal (Youth CareerConnect), and Foundation grants supporting the development of regional consortia of K–12 school districts, postsecondary institutions, and local industry partners strongly influenced the activities of the nine initiative districts in 2014–15. These regional consortia hold promise for furthering two areas of Linked Learning that have been underdeveloped in the district initiative: work-based learning and postsecondary transitions.

Work–based Learning

The Linked Learning approach calls for all students to have access to a sequence of high-quality real-world learning experiences that are aligned with pathway student learning outcomes and provide opportunities for students to apply academic and technical knowledge and skills learned in the classroom. However, as we have documented in prior evaluation reports, work-based learning has long been an underdeveloped component of the Linked Learning approach. In particular, districts have struggled with providing students with higher level work-based learning experiences such as job shadows and internships. Moreover, the nine districts are still working to create the type of districtwide work-based learning systems that would ensure that all students in Linked Learning pathways have access to a full range of work-based learning experiences.

Work-based learning became a much higher priority in 2014–15, largely because of the CCPT grants. All nine districts in the initiative were part of regional consortia that received first-round CCPT grants in 2014, and three were part of consortia that received second-round CCPT grants in 2015. The grants appear to be gradually changing the status quo for work-based learning, with the direction of activities in several of the districts pointing to the possibility that work-based learning systems may emerge over the next year or so.

State and Federal Funding for Regional Partnerships

District	CCPT Round 1 (2014)	CCPT Round 2 (2015)	Youth Career Connect (2014)
Antioch Unified	✓		
Long Beach Unified	✓		
Los Angeles Unified	✓		✓
Montebello Unified	✓		
Oakland Unified	✓		
Pasadena Unified	✓	✓	
Porterville Unified	✓	✓	
Sacramento City Unified	✓		
West Contra Costa Unified	✓		

CCPT grants are supporting the development of work-based learning opportunities in two primary ways:

- CCPT funding has allowed districts to hire additional work-based learning staff, which has the potential to both increase available work-based learning opportunities and provide more administrative support for connecting students to opportunities.
- Some regional consortia have contracted with or developed intermediary organizations to engage industry partners, coordinate between partner organizations, and lessen the burden on pathway teachers of locating work-based learning experiences.

Although districts are making substantial progress on developing work-based learning systems, these efforts have unfolded slowly in this first year of grant implementation. Finding staff with the background and skills needed to develop work-based learning experiences can be difficult. The ideal candidate should have industry-specific knowledge and connections and also understand how work-based learning can be used to enrich traditional schooling by making academic learning more real and relevant for students. Despite the additional funds, districts are still challenged to find and train the personnel who are able to navigate both education and industry settings. As a result, these systems are not yet fully operational and pathway teachers remain responsible for both securing work-based learning opportunities and integrating them into instruction. Thus, student access to quality work-based learning experiences continues to be uneven within districts.

Postsecondary Partnerships

Another major focus of the funding for regional expansion is to bring K–12 districts and postsecondary institutions together to address cross-level barriers to students' success in postsecondary education. We found that

- Districts have used grant resources to initiate or deepen K–12 and postsecondary partnerships. Several districts reported that this type of collaboration was one of the greatest successes in the 2014–15 school year.
- Regional consortia have made progress in removing some of the bureaucratic and policy barriers to students' transitions between K–12 and postsecondary systems. In particular, initiative districts were working to develop more dual-enrollment opportunities for students and a few districts began creating regional agreements that would enable students to receive credit for articulated courses at community colleges within the region.

Building Sustainable Linked Learning District Systems

In addition to regional expansion efforts to enhance work-based learning and postsecondary partnerships, Linked Learning leaders in the nine initiative districts are deeply engaged in three core areas critical to sustaining the Linked Learning approach: establishing stable and distributed leadership, securing core funding, and institutionalizing Linked Learning by integrating the approach into key district policies and priorities.

Leadership

Distributed ownership of Linked Learning facilitates problem solving during implementation and protects the reform in the face of leadership turnover. In 2014–15, we found that districts were actively working to ensure the sustainability of Linked Learning by establishing distributed leadership structures, although turnover in district leadership has slowed these efforts in some places. Interviews with Linked Learning leaders in the nine districts suggested that

- To implement Linked Learning effectively and comprehensively, districts involved human resources personnel, professional development providers, coaches, and counselors, among other personnel to allow strategic planning across district departments.

- In districts where leadership of Linked Learning remains concentrated under the Linked Learning director alone, consolidation of leadership and decisionmaking authority has prevented relevant stakeholders, such as other district leaders and pathway leaders, from taking ownership of the initiative.

Stability among high-level district leadership, including superintendents and Linked Learning directors, has facilitated the implementation of the approach and the creation of strong distributed leadership structures. Consistent, stable leadership, however, is more the exception than the norm. During 2014–15, four districts in the initiative had new superintendents. Interviewees in the districts noted that these leaders verbally committed to sustaining Linked Learning implementation, but in two of the districts veterans of the initiative also reported some frustration that progress had slowed. In one case, organizational changes made by the new superintendent may actually set Linked Learning implementation back a year or two.

> *The goal is shared responsibility for Linked Learning, to share the responsibility of championing the approach...*
>
> -Linked Learning director

Funding

The sustainability of Linked Learning will rest not only on stable and consistent leadership, but also on stable and consistent funding. Districts should transition from viewing Linked Learning as primarily a grant-funded initiative to providing core support for it from district general funds. Some are taking steps in this direction using general funds to support key Linked Learning staff and by using new funding sources from grants and public ballot measures to build infrastructure that will help them sustain Linked Learning.

The advent of the Local Control Funding Formula (LCFF) in 2014 has aided this shift, distributing public education funding in California based on average daily school attendance, with greater weight given to certain grade levels and targeted groups of high-need students. LCFF also provides districts greater control over the use of funds by collapsing most previous categorical funds into a single funding stream.

In this sixth year, we found that

- Two districts shifted the salaries of key Linked Learning staff member from grant funds to general funds for the first time.
- Two other districts have set aside a portion of their LCFF money to support Linked Learning costs, such as support services like instructional and CTE coaches, pathway coordinators, and planning time for pathway leads.

Despite these positive steps, some of the smaller districts in the initiative still experience budgetary constraints that may impact how Linked Learning supports and services can or will be maintained when grant funding is no longer available. Beyond earmarked funding, integrating Linked Learning into key district policies and priorities is another key element in sustaining this reform.

Integrating Linked Learning into Key District Policies and Priorities

Some Linked Learning leaders have been successful in incorporating Linked Learning into key district policies and priorities, thus helping ensure sustainability. The LCFF requires districts to develop 3-year Local Control Accountability Plans (LCAPs) that identify goals and establish metrics for measuring progress toward the goals, offering an important opportunity to codify Linked Learning as a key district priority and establish local general fund support for it. In the sixth year, we found that

- Five districts signaled their long-term commitment to the initiative by explicitly incorporating Linked Learning into their LCAP.

Districts also worked to combine Linked Learning with their curriculum and instruction improvement efforts through three major strategies:

- **Structurally integrating the Linked Learning and Curriculum and Instruction departments—**Two districts physically moved the Linked Learning department under the district's instructional umbrella. District staff and pathway teachers both viewed this as a positive development. As one Linked Learning administrator stated, "Our leads feel a little less like they are being pulled in two separate directions."
- **Instituting formal systems that encourage collaboration—**Three districts created formalized systems that encouraged collaboration among the Linked Learning and curriculum and instruction departments.
- **Aligning the graduate student profile with Linked Learning outcomes—**Some districts were also integrating the initiative into curriculum and instruction by aligning their student graduate profile with Linked Learning outcomes such as project-based learning, student collaboration, and participation in work-based learning opportunities.

Seven of the nine districts in the initiative used one or more of these three strategies to align Linked Learning with planned reforms of curriculum, instruction, and/or assessment related to the Common Core State Standards or graduate profile. This is strong evidence that Linked Learning is becoming thoroughly institutionalized in the majority of the districts.

Looking Ahead

Four years of student outcomes analysis have highlighted the promise of the Linked Learning approach. This year's results indicated that Linked Learning certified pathway students are less likely to drop out and more likely to graduate than similar students in traditional high school programs. Collectively, our analyses produced limited but positive evidence that certified pathway students are more likely to be college elligible than their peers. On the other hand, our findings also pointed to areas of growth for the Linked Learning approach. Pathway students were not more likely to complete a–g course requirements than similar students in traditional high school. To substantially improve Linked Learning graduates' college eligibility, pathways will need to ensure that students have access to and complete all the required a–g courses. Districts have been responding to this deficiency by revisiting pathway courses of study and revamping CTE courses to meet a–g standards.

This year we also saw evidence of a clear commitment from most initiative districts to sustaining Linked Learning. Districts are creating distributed leadership structures, integrating Linked Learning into district policies and priorities, and shifting key staff positions from grant funds to general funds.

Over the course of the initiative, the Linked Learning leaders in the nine districts have come to a consensus that a slower pace for pathway development and expansion is desirable and are concentrating on developing systems to assess and improve pathway quality. As we look ahead to the regional expansion of Linked Learning in California, districts interested in adopting the approach would do well to learn from these experiences. The lack of positive student outcomes findings for non-certified pathways—programs that are career themed but may not adhere to the Linked Learning approach—further validates this emphasis on quality over quantity and provides a note of caution to districts interested in rapidly scaling Linked Learning pathways.

State, federal, and Foundation grants supporting the development of regional consortia of K–12 school districts, postsecondary institutions, and local industry partners strongly influenced the activities of the nine initiative districts in 2014–15. These regional efforts hold great promise for helping districts advance two areas of Linked Learning that have been underdeveloped in the initiative districts: work-based learning and postsecondary transitions. The regional approach provides an opportunity for industry, communities, districts, and postsecondary institutions to form productive partnerships and tackle cross-sector issues that are challenging for any one organization to take on alone. These partnerships have the potential to make a difference for students by offering them more real-world experiences and supporting them in their postsecondary transition.

Despite the promise of the regional expansion for supporting systems and building partnerships, much work remains to change day-to-day instruction in Linked Learning classrooms. A fundamental transformation of teaching and learning requires ongoing coaching and job-embedded support for pathway teachers. The initiative districts are making some movement in this area with the hiring of dedicated internal coaches who are charged with supporting pathway teams with curriculum, instruction, and assessment. As Linked Learning continues to expand, stakeholders will need to continue focusing on high-quality teaching and learning. Without this focus, Linked Learning is unlikely to impact student learning in a meaningful way.

Districts received their final round of grant funding from the Foundation through ConnectEd during the 2014–15 school year. In the next year of the evaluation, we will report on the progress of the nine districts as they transition to supporting Linked Learning implementation in new ways. We will examine districts' plans for sustaining and scaling Linked Learning and will continue to document the role of new regional partnerships in expanding work-based learning opportunities and smoothing students' postsecondary transitions in the initiative districts. The next evaluation report will also describe how well Linked Learning graduates fare compared with similar peers as they transition to postsecondary endeavors.

Chapter 1: Introduction

Since the James Irvine Foundation launched it in 2009, the California Linked Learning District Initiative has gained momentum among K–12 and postsecondary educators, policymakers, and business leaders as a promising approach for preparing all students for college, career, and life. Over the past few years, the Foundation has been shifting from a district-focused strategy to a regional approach for advancing and scaling Linked Learning. As a result, this report captures a transitional moment, with 2014–15 marking the final year of the Foundation's funding for the initiative

In 2015, the Foundation awarded 3-year grants to establish self-sustaining Regional Hubs of Excellence that would bring together district, postsecondary, workforce, and community partners to support and expand adoption of the Linked Learning approach. At the same time, 2014–15 ushered in unprecedented state and federal funding supporting the development of regional partnerships for the expansion and improvement of career pathways programs. Most notably, the California Career Pathway Trust (CCPT) grants awarded in 2014 and 2015 and the federal Youth CareerConnect (YCC) grants awarded in 2014 constituted a significant increase in the resources available for the nine initiative districts. Specifically, these grants provided funds to develop regional partnerships to increase student access to high-quality work-based learning opportunities and to smooth educational transitions for students by aligning and articulating career-themed pathways with community colleges. The Foundation also provided additional funds in 2014 for the California Community College Linked Learning Initiative (CCCLLI) to continue building partnerships between community colleges and Linked Learning high schools.

New Funds to Develop Linked Learning at the Regional Level

California Career Pathways Trust (CCPT) Fund: The CCPT provided $250 million in 2014 and $250 million in 2015 in state grant funding to create sustained career pathway programs that link business entities, K–12 schools, community organizations, and postsecondary institutions to prepare students for the 21st century workplace. CCPT grants support the development of work-based learning infrastructure, innovative regional partnerships for career pathway support, and the expansion and improvement of career pathway programs into postsecondary endeavors.

Youth CareerConnect (YCC) Grant Program: A joint initiative of the U.S. Departments of Labor and Education, the YCC awarded grants totaling $107 million in 2014 to support 24 partnerships of districts, institutions of higher education, workforce investment systems, and employers to "enhance instruction and deliver real-world learning opportunities for students."

Irvine Regional Planning and Implementation Grants: In 2013, the Foundation provided seven major California regions with planning grants to build regional commitment and identify a consortium of partners—including postsecondary, workforce, and community partners—to create a self-sustaining regional infrastructure for advancing and scaling Linked Learning. In 2015, the Foundation awarded regional implementation grants to a subset of planning grant recipients. Each grantee received approximately $750,000 to support and scale broad adoption of the Linked Learning approach through the establishment of Regional Hubs of Excellence.

This sixth annual evaluation report discusses the implications of regional systems-building on Linked Learning implementation in the nine districts, specifically in the context of new regional collaborations through the CCPT grants and the Foundation's shift to a regional Linked Learning approach. We examine the influence of regional efforts on districts' progress in developing work-based learning systems and on their plans for expanding and sustaining Linked Learning while maintaining pathway quality and fidelity to the Linked Learning approach. We also examine districts' progress in expanding pathway access and ensuring equity, looking at patterns in student enrollment and persistence in pathways. Finally, we look at students' experiences and outcomes as they complete high school and transition into postsecondary education and careers, discussing the contributions that the CCPT grants have had on strengthening secondary-postsecondary relationships.

About Linked Learning and the District Initiative

Since 2006, the Foundation has made significant investments in Linked Learning, a promising approach to transforming education in California. Linked Learning integrates rigorous academics with real-world experiences to provide high school students with a personally relevant, wholly engaging experience and open them to college and career opportunities they never imagined.

The Linked Learning approach builds on the more than four decades of experience gained by California schools that combine academic and technical content to raise student achievement. The objectives are to improve high school graduation rates and increase successful transitions to a full range of postsecondary education opportunities, particularly for low-income and disadvantaged youth. Linked Learning is delivered through career pathways, comprehensive programs of study that connect learning in the classroom with real-world applications outside school.

Core Components of the Linked Learning Approach

The Linked Learning approach calls for the close integration of four core components:

Rigorous academics that prepare student to succeed in college.

Career-technical education courses in sequence, emphasizing real-world application of academic learning.

Work-based learning that provides exposure to real-world workplaces and teaches the professional skills needed to thrive in a career.

Comprehensive support services to address the individual needs of all students, ensuring equity of access, opportunity, and success.

In 2009, the Irvine Foundation launched the California Linked Learning District Initiative, a demonstration of Linked Learning in nine California school districts. ConnectEd: The California Center for College and Career, established by the Foundation in 2006, served as the primary intermediary and technical assistance provider. Numerous other partners have supported the initiative over the years, including the Stanford Center for Opportunity Policy in Education, the Center for Powerful Public Schools (formerly the Los Angeles Small Schools Center), National Academy Foundation (NAF), the Career Academy Support Network, and The Education Trust–West. More recently, the Foundation brought in Jobs for the Future (JFF) to support the regional work.

Districts Participating in the Linked Learning District Initiative

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

The Foundation supported the nine demonstration districts in developing systems of career pathways that are available to all their high school students, with students selecting their pathway. The initiative served as a vehicle for the Foundation and its partners to develop and refine the Linked Learning approach, to determine what makes Linked Learning successful at a systemic level, and to demonstrate the viability of Linked Learning as a comprehensive approach for high school reform.

Status of the District Initiative

As of 2014–15, the nine districts participating in the Linked Learning District Initiative varied in size, from slightly over 14,000 to over 640,000 students, and represented a variety of geographic regions across California (California Department of Education, n.d.). All had a high proportion of disadvantaged students and below-average student achievement as measured by California's Academic Performance Index (API), ranging from 715 to 784 compared with a statewide average of 790 (California Department of Education, n.d.).[10] More than three-quarters of the high school students in each district were nonwhite, and more than half were socioeconomically disadvantaged, with district poverty rates ranging from 62% to 87%.[11] Exhibit 1-1 summarizes student demographic and achievement data for the nine districts.

[10] 2012 Base API

[11] Based on the percentage of students who qualified for free or reduced-priced meals in 2014–15.

Exhibit 1-1
Demographic and Achievement Profile of Linked Learning Districts, 2014–15

District	High School Enrollment[a]	Minority[b] (%)	English Language Learner (%)	Poverty[c] (%)	Graduation Rate (%)		CAHSEE Pass Rate[d] (%)				Certified Pathways[e]
					2012–13	2013–14	2014 Math	2014 ELA	2015 Math	2015 ELA	
Antioch Unified	5,811	80	9	67	78	77	75	78	76	82	3
Long Beach Unified	25,368	85	14	66	81	81	85	80	85	83	6
Los Angeles Unified[f]	194,766	91	14	76	68	70	80	78	80	79	6
Montebello Unified	9,958	98	16	87	87	87	80	78	81	82	0
Oakland Unified	12,420	93	23	75	63	61	69	63	69	69	4
Pasadena Unified	5,485	86	11	66	83	82	82	78	80	82	5
Porterville Unified	6,382	82	14	83	84	84	81	76	80	78	7
Sacramento City Unified	13,042	83	14	62	85	85	80	77	80	79	5
West Contra Costa Unified	8,519	91	23	70	80	78	72	72	73	75	4

Source: California Department of Education (CDE). http://data1.cde.ca.gov/dataquest/

[a] Includes enrollment at charter and noncharter schools classified by the CDE as high schools (public) and continuation high schools with active/pending status.

[b] Percentage of all students who did not identify as "White, not Hispanic," including students whose ethnic designation was listed as "not reported."

[c] Based on the percentage of students who qualified for free or reduced-price meals in 2014–15 in the whole district (not just high school students).

[d] The California High School Exit Examination (CAHSEE) passing rates were based on the March exam date for 10th-grade students for 2013–14 and 2014–15 for all districts except Pasadena, Porterville, Oakland, West Contra Costa, and Long Beach. CAHSEE passing rates for Pasadena, Porterville, Oakland, and West Contra Costa were based on a February exam date for 10th-grade students for 2013–14 and 2014–15. CAHSEE passing rates for Long Beach were averaged between the February and March exams. ELA is English language arts.

[e] Updated 2014-15 data for certified pathways. Includes pathways certified by ConnectEd and the National Academy Foundation (NAF).

[f] Profile is for all Los Angeles Unified. The initial Linked Learning grant was made to Local District 4, but the district restructured beginning with the 2012–13 school year, dissolving the local district structures. Linked Learning is now a full districtwide initiative.

In 2010, ConnectEd developed and began using a tool and process to certify the quality of individual career pathways along the dimensions of design, engaged learning, system support, and evaluation and accountability. ConnectEd uses the certification process to establish and support examples of programs that implement Linked Learning with high quality and fidelity, whether they are part of the district initiative or are individual schools or programs outside the initiative. Beginning with the 2012–13 school year, ConnectEd officially recognized NAF certification for Linked Learning pathways; as a result, districts can choose which certification process to go through. This evaluation primarily focused on certified pathways but also included non-certified pathways in analyses and data collection. We define non-certified pathways broadly as any program that is flagged by a district as a pathway but that has not been certified as a Linked Learning pathway; the definition includes developing Linked Learning pathways and those deemed in progress. These programs typically share some important features with the certified pathways, such as a small cohort and career theme, but vary in their implementation of the full Linked Learning approach. In this report, we use the term *pathway* to refer broadly to pathways in all stages of development, although our qualitative analysis drew on information from certified and more advanced pathways. Our quantitative analysis examined initial enrollment patterns and outcomes for students in pathways that were certified as of students' 10th-grade year, as well student outcomes for non-certified pathways. Exhibit 1-2 lists the 40 pathways certified as of November 2015 in the nine initiative districts; we included only pathways certified as of 2012–13 or earlier in at least one cohort of the quantitative analyses.

Exhibit 1-2
Linked Learning Pathways Meeting Certification Criteria as of 2014–15

District	Certified Pathways	School Types[a]	Certification Year
Antioch Unified	Health Science and Medical Technology at Dozier-Libbey Medical High School	Small school	2010–11
	Engineering and Designing Green Environments	SLC[b]	2012–13
	Law & Justice Academy	SLC[c]	2012–13
Long Beach Unified	Architecture, Construction and Engineering Academy	SLC[c]	2009–10
	California Academy of Mathematics and Science	Small school[d]	2010–11
	Community of Musicians, Performers, Artists, and Social Scientists	SLC	2010–11
	PEACE Academy	SLC	2010–11
	Media and Communications	SLC	2012–13
	Pacific Rim Business Academy	SLC[c]	2013–14
Los Angeles Unified	Los Angeles High School of the Arts	Small school	2011–12
	Los Angeles School of Global Studies	SLC	2011–12
	New Media Academy	SLC[c]	2012–13
	STEM Academy of Hollywood	Small school[b]	2013–14
	School of Business and Tourism	SLC[c]	2014–15
	School for the Visual Arts and Humanities	SLC	2014–15
Oakland Unified	Life Academy of Health and Bioscience	Small school[c]	2010–11
	Media College Preparatory	Small school[c]	2010–11
	Education Academy	SLC[c]	2011–12
	Computer Science & Technology Academy	SLC[c]	2014–15

Exhibit 1-2
Linked Learning Pathways Meeting Certification Criteria as of 2014–15 (concluded)

District	Certified Pathways	School Types[a]	Certification Year
Pasadena Unified	Arts, Entertainment, and Media Academy	SLC[c]	2010–11
	Business and Entrepreneurship Academy	SLC[c]	2010–11
	Creative Arts, Media, and Design Academy	SLC	2010–11
	Engineering and Environmental Science Academy	SLC[b]	2012–13
	Health Academy	SLC[b,c]	2013–14
Porterville Unified	Partnership Academy of Business/Academy of Finance	SLC[b,c]	2010–11
	Engineering Academy	SLC[b]	2010–11
	Multimedia Technology Academy	SLC[b,c]	2011–12
	Partnership Academy of Health Sciences and Careers	SLC[b,c]	2011–12
	Academy of Performing Arts	SLC	2011–12
	Academy of Digital Design and Communication	SLC[b]	2012–13
	Alternative Energy Resource Occupations Academy	SLC[c]	2013–14
Sacramento Unified	Health Professions High School	Small school[b,d]	2010–11
	New Technology High School	Small school	2010–11
	Johnson Corporate Business Academy	SLC[b,c]	2012–13
	The MET	Small school	2012–13
	School of Engineering and Sciences	Small school[b]	2012–13
West Contra Costa Unified	Multimedia Academy	SLC[c]	2010–11
	Law Academy	SLC[c]	2010–11
	Engineering Partnership Academy	SLC[c]	2011–12
	Health Academy	SLC[c]	2012–13

Source: Communication from ConnectEd (November 2015). Montebello has are no certified pathways.

Note: We included only pathways certified as of 2012–13 or earlier in at least one cohort of the quantitative analyses in the report.

[a] SLC refers to a small learning community within a comprehensive high school, not necessarily supported by a federal Smaller Learning Communities program grant. Small school refers to a small stand-alone school.

[b] Pathway is supported by the National Academy Foundation (NAF).

[c] Pathway is a California Partnership Academy (CPA).

[d] Magnet school.

Sixth-Year Evaluation Activities

In 2009, the Foundation commissioned the Center for Education Policy at SRI International to conduct a rigorous multiyear evaluation of the initiative. SRI is assessing the nine districts' implementation of the Linked Learning pathways and analyzing outcomes for students participating in them. We are using a multimethod research design that includes qualitative and quantitative data collection and analysis. The following key research questions guide this evaluation, viewed through the lens of the influence of new funding for regional expansion:

- How are districts planning to support the development and improvement of the core Linked Learning components (academic, technical, work-based learning, and student supports)?
- How sustainable is the Linked Learning approach for districts, and what evidence indicates that districts will remain committed to Linked Learning as their primary strategy for high school reform?
- How are districts planning to sustain Linked Learning and maintain districtwide systems of support for existing and new pathways, and what factors support or impede sustainability?
- What are the educational experiences and outcomes for students participating in pathways and how do they compare with those of nonpathway students?
- How do pathway graduates experience the transition to postsecondary education and careers, and how do their outcomes compare with those of nonpathway graduates?

The evaluation draws on two sources of data:

1. Interviews with ConnectEd coaches and with key district and school personnel, focus groups with primarily 12th-grade pathway students from across all nine districts, interviews with administrative and student support staff members from community colleges with large concentrations of Linked Learning graduates in four of the nine districts, and focus groups with Linked Learning graduates in their first year at these same colleges. This qualitative data collection focused on pathways that were certified, nearing certification, and/or involved in regional grant activities.
2. Student demographic and achievement data from the districts that enabled us to examine initial pathway enrollment patterns and compare engagement and achievement outcomes for students in certified pathways and those in non-certified pathways with their peers in traditional high school programs.[12]

[12] Data for all districts except Los Angeles came through a third party, the Institute for Evidence-Based Change. Montebello did not have any certified pathways during the evaluation period. Providing all the specific data elements needed for the analysis also posed a challenge for the districts, which often house data elements in different systems. Districts have had to develop systems for flagging and tracking pathway students and for reporting data elements not previously captured, such as pathway enrollment.

Report Overview

This report differs from prior evaluation reports in that it focuses on the implications of the shift to a regional strategy. Chapter 2 discusses the influence of regional systems-building on districts' efforts to expand and improve work-based learning systems and opportunities for students and on efforts to develop postsecondary partnerships. Chapter 3 provides an update on districts' plans for expanding and sustaining Linked Learning and the influence of new funding sources; we also touch on the tension districts experience between efforts to maintain internal pathway quality and the push to develop new pathways in the context of regional expansion. Chapter 4 discusses in more depth what districts are doing to ensure internal pathway quality and fidelity to the Linked Learning approach and the role of current resources in supporting such efforts. Chapter 5 describes districts' continued efforts to expand access to Linked Learning pathways for all students, delving into pathway student enrollment and persistence patterns. Moving from access and equity, Chapter 6 compares engagement and achievement outcomes for pathway students and their peers. The final chapter distills the key findings from this sixth year of the study and includes implications for the Foundation in its shift from a district-focused Linked Learning strategy to a regional approach.

Chapter 2: Promise of Regional Expansion for Work-Based Learning and Postsecondary Transitions

Key Findings

- Work-based learning, long an underdeveloped core component of the Linked Learning approach in the nine initiative districts, became a much higher priority in 2014–15 largely because of the California Career Pathway Trust grants.
- Districts leveraged regional funds to hire additional work-based learning staff; however, hiring and training new staff takes time and such efforts have unfolded slowly in this first year of grant implementation. As a result, student access to high-quality work-based learning experiences remained uneven across pathways within districts in 2014–15.
- Some regional consortia engaged with or developed an intermediary organization to convene partners, engage employers, and manage a system of work-based learning opportunities.
- Districts are using grant resources to initiate or deepen K–12 and postsecondary partnerships. Several districts reported that this type of collaboration was one of the greatest successes in the 2014–15 school year.
- Regional consortia have made progress in removing some of the bureaucratic and policy barriers to students' transitions between K–12 and postsecondary systems; others will require legislative or statewide policy action to remove.

As described in Chapter 1, state, federal, and Foundation grants supporting the development of regional consortia of K–12 school districts, postsecondary institutions, and local industry partners are beginning to shape the California education landscape, particularly in the areas of work-based learning and postsecondary transitions. Of the available funding streams discussed in Chapter 1, the two that were most relevant for districts' implementation of Linked Learning in 2014-15 were the California Career Pathways Trust (CCPT) and federal Youth CareerConnect (YCC) grants (see Exhibit 2-1). All nine districts were part of regional consortia awarded first-round CCPT grants; Los Angeles Unified School District also received a YCC grant. The second round of CCPT grants and the Foundation's regional hub grants were both awarded in 2015 but had not yet affected recipients' efforts at the time of this data collection.

Exhibit 2-1
State and Federal Funding for Regional Partnerships

District	CCPT Round 1 (2014)	CCPT Round 2 (2015)[a]	Youth Career Connect (2014)
Antioch Unified	✓		
Long Beach Unified	✓		
Los Angeles Unified	✓		✓
Montebello Unified	✓		
Oakland Unified	✓		
Pasadena Unified	✓	✓	
Porterville Unified	✓	✓	
Sacramento City Unified	✓		
West Contra Costa Unified	✓		

[a] Los Angeles Community College District received a round 2 CCPT grant.

The first round of CCPT grants (awarded in spring 2014) had the strongest influence on the initiative in 2014–15, as all nine districts were part of consortia awarded a first-round grant. The CCPT grants are explicitly focused on elements that are critical to fully implementing the Linked Learning approach: development of work-based learning expertise; formation of regional partnerships among school districts, postsecondary institutions, county offices of education, Workforce Investment Boards, community organizations, and business and industry; integration of academic and career and technical education (CTE); and bridging of gaps between the different levels of education such as secondary and postsecondary. Exhibit 2-2 indicates the number and diversity of organizations involved in each first-round CCPT, with detail on the primary fiscal agent, the partners involved, and the grant award amount.

Exhibit 2-2
California Career Pathways Trust Consortia 2014–15

District	Fiscal Agent	CCPT Consortium	Consortium Partner Type	Amount ($)
Antioch Unified	Contra Costa County Office of Education	Diablo Gateways to Innovation Consortium	11 School districts (21 high schools, 2 adult schools) 1 County office of education 2 Regional occupation program centers 4 Community colleges 18 Businesses 1 University	7,998,000
Long Beach Unified	Long Beach Unified School District	NA	1 School district (7 high schools) 1 Community college 14 Businesses 1 University	6,000,000[a]
Los Angeles Unified	Los Angeles Unified School District	Los Angeles Coalition for Linked Learning	2 School districts (24 high schools, 1 charter school) 6 Community colleges 27 Businesses	15,000,000
Montebello Unified	Montebello Unified School District	NA	1 School district (4 high schools) 1 Community college 16 Businesses	6,000,000
Oakland Unified	Peralta Community College District	East Bay I-80/ 880Consortium	11 School districts (18 high schools) 6 Community colleges 20 Businesses	14,990,966
Pasadena Unified	Pasadena Area Community College District	Pasadena Area Consortium	4 School districts (15 high schools, 1 charter school) 8 Community colleges 24 Businesses	14,999,053[b]
Porterville Unified	Tulare County Office of Education	Tulare/Kings County Consortium	11 School districts (24 high schools, 1 adult school) 3 Community colleges 37 Businesses	14,790,007
Sacramento City Unified	Elk Grove Unified School District	Capitol Academies and Pathways	2 School districts (16 high schools) 4 Community colleges 2 Businesses 1 University	6,000,000[c]
West Contra Costa Unified	Peralta Community College District	East Bay I-80/ 880Consortium	11 School districts (18 high schools) 6 Community colleges 20 Businesses	14,990,966

Source: Data retrieved from CDE website: http://www.cde.ca.gov/fg/fo/r17/ccpt14result.asp for first-round CCPT awardees.

[a]Long Beach Unified is also part of a second first-round CCPT grant led by Long Beach City College for $15 million.

[b]Pasadena Unified is also part of a second first-round CCPT grant led by Los Angeles Unified for $15 million.

[c]Sacramento City Unified is also part of a second first-round CCPT grant led by the Sacramento County Office of Education (SCOE) for $15 million.

If implemented effectively, the CCPT grants have the potential to aid districts in providing their students more and better quality work-based learning experiences and to facilitate smoother transitions between secondary and postsecondary education systems. Whether districts realize this potential, however, depends on their level of engagement in their respective consortia, the amount of funding they receive out of the total award amount, and the goals the consortia prioritizes. As discussed below, the combination of these three factors—engagement, funding, and goals—affect both how much funding each of the nine initiative districts has access to and how strong a voice each one has within its consortium.

This chapter first outlines how these new funding streams have begun to strengthen work-based learning systems and foster collaboration between initiative districts and local postsecondary institutions. Then we discuss challenges to implementation as partners began the process of learning to work together, developing new areas of expertise, and establishing goals for their regional collaboration efforts. We conclude by drawing implications from the nine districts' experiences working with regional partners that may inform the Foundation's regional work moving forward.

Strengthening Work-Based Learning Through Regional Collaboration

ConnectEd's *Rubric for Linked Learning Pathway Quality Review and Continuous Improvement* (2012) defines the quality of work-based learning in terms of the accessibility of the learning experiences to all pathway students regardless of prior academic achievement and behavior; the scope and sequencing of experiences; and the quality of connections of work-based learning to pathway coursework. Ideally, all pathway students should have access to a 4-year sequence of high-quality real-world learning experiences that are aligned with intended pathway learning outcomes and provide opportunities for students to apply the academic and technical knowledge and skills learned in the classroom. With the help of ConnectEd, the Linked Learning staff in the initiative districts gradually defined an ideal continuum of work-based learning activities for 3 or 4 years of high school (depending on the pathway configuration in a given district). Rarely, however, could a district actualize the ideal for a variety of reasons, ranging from lack of time to develop relationships with industry partners to unfamiliarity with local employers to transportation issues for students. In particular, districts have struggled with providing students with higher level work-based learning experiences such as job shadows and internships. Moreover, in the past, the nine districts have struggled to create the type of districtwide work-based learning systems that would ensure that all students in Linked Learning pathways have access to a full range of learning experiences.

Yet the CCPT grants do appear to be gradually changing the status quo for work-based learning in the nine districts. The direction of activities in several of the districts indicates the possibility that work-based learning systems may emerge over the next year or so, largely as a result of districts' ability to share the load for developing them with multiple partners through their CCPT involvement. In particular, CCPT funding has enabled many districts to hire additional staff dedicated to work-based learning and has spurred the formation of regional intermediary organizations that can take on the challenging and time-consuming work of cultivating industry partnerships and matching students with high-quality work-based learning experiences such as internships.

California Career Pathways Trust funding enabled districts to hire additional work-based learning staff, which has the potential to increase the number of learning opportunities for students. However, hiring and training new staff takes time, and such efforts have unfolded slowly in this first year of grant implementation.

In the fifth-year evaluation report, we noted that districts had made some progress in funding staff dedicated to coordinating work-based learning opportunities. At that point, six of the nine districts employed district-level staff whose primary responsibility was to support school sites in developing high-quality work-based learning while concurrently building and sustaining strong industry connections and developing broader district-level work-based learning structures and systems. However, those roles ranged from one part-time position spread across multiple schools to several full-time coordinators overseeing such responsibilities across the district. Because of increased funding for work-based learning through the CCPT grants (and YCC in the case of Los Angeles), four of the nine districts hired additional work-based learning staff in 2014–15 and three planned to do so by the 2015–16 school year.

However, districts' hiring and training of new work-based learning staff has unfolded slowly in many cases. The ideal candidate has industry-specific knowledge and connections and also understands how work-based learning can be used to enrich traditional schooling by making academic learning more real and relevant for students. Despite the additional funds, districts are still challenged to find and train the personnel who are able to navigate both education and industry settings.

As the Linked Learning director in one large district said,

> [We have our] $15 million grant and that's just a lot of folks to corral. Everyone appears to be working, it's just a lot of people. Progress is definitely slower than we initially [anticipated], even on the $6 million [local] grant. It's been a year, and we are only now just beginning to be at the place where we can say we're doing anything because it takes a long time. Just hiring is a nightmare....Then finding the talent out there because, like I said, the knowledge base of Linked Learning and the knowledge base of what we're doing is fairly shallow.

This quotation is from an interview conducted in April 2015—nearly a year into the first round of CCPT grants—and reinforces the point made by numerous respondents that the rollout of grant activities has been slow at least in part because the work-based learning positions to be filled are unfamiliar roles in education, and there is a short supply of individuals with the needed skill sets.

Even districts that were able to bring new work-based learning staff on board early in the school year found that a substantial amount of time was required to train them and clarify roles. For example, partnered with the nearby Elk Grove school district on a $6 million CCPT grant, Sacramento City Unified spent the 2014–15 school year hiring and training staff in five industry sectors: energy and infrastructure, advanced manufacturing, health services, agriculture and food production, and information communications technology. For each sector, the district hired one sector coach and one career specialist. The sector coaches are responsible for supporting pathway teachers in integrating work-based learning into their curricula. The career specialists are responsible for building pathway capacity to develop and maintain relationships with industry partners. Career specialists will also serve as liaisons between pathways and NextEd, a regional intermediary charged with building a broad base of industry engagement and creating a bank of work-based learning opportunities that pathways can draw from as needed. This multipronged approach has the potential to greatly improve access to work-based learning in Sacramento. Yet district staff readily admitted that getting everyone trained and on the same page took more time than they had anticipated:

> What has been challenging has been just the start-up; building relationships, getting to know each other, collaborating across districts, and utilizing the same staff to support academies in both districts was challenging. So we began and then had to take a few steps back to reexamine what is the grant goal, who is doing what, what are the roles and responsibilities of each staff member, to be very clear about things. So we did 4 days of staff retreat. That happened in January, February, and March.... That helped us to then map out 6-month goal and deliverables and who is responsible for what work.... Now in the summer we are going to do a retreat for several more days to map out the rest of the 4-year plan.

Sacramento and Elk Grove leaders realized that their new staff needed collaboration time and coaching in the Linked Learning approach so they created a community of practice for all the new work-based learning staff led by a ConnectEd coach. District staff believe that this community of practice has been invaluable, enabling new staff to define their roles and responsibilities and maintain fidelity to the Linked Learning approach.

Some regional consortia have contracted with or developed intermediary organizations to engage industry partners and remove the burden of locating work-based learning experiences from pathway teachers.

In addition to hiring more staff dedicated to work-based learning, four districts are also part of regional consortia that were developing intermediaries through their CCPT grants as of spring 2014; these intermediaries will coordinate work-based learning opportunities and strive to ensure quality across them for students in their respective regional consortia (see Exhibit 2-3 for a list of the possible functions of intermediary organizations). Intermediary organizations can be existing nonprofits that are contracted to take on new roles, such as NextEd in Sacramento, or they can be new organizations that are "built for purpose," such as the Long Beach Collaborative to Advance Linked Learning, which will meet the needs of Long Beach Unified and its regional partner colleges. In either case, successful intermediaries generally possess several key attributes: They have dedicated staff with contacts in the employer community, they are seen as a trusted broker and are considered to be neutral, they are experienced in building networks across sectors, and they are viewed as a partner and not just a service provider (Jobs for the Future, 2015).

Intermediaries can be particularly valuable in helping districts secure high-quality work-based learning opportunities, such as internships, that require strong industry connections and substantial legwork to arrange. Long Beach and Porterville are part of CCPT partnerships that in 2014–15 began developing intermediaries that will play a major role in identifying internships for students. The Linked Learning director in Porterville noted that an intermediary will be less "shy" relative to individual pathway and district staff about approaching larger corporations as potential internship sites; Porterville's goal is a senior year internship for all students—approximately 900 placements per year given the district's current pathway enrollment figures.

Proposed Functions of a Work-Based Learning Intermediary Organization

- Stays up to date on the regional economy and labor market
- Develops and integrates work-based learning sequences within educational systems
- Engages employers in key sectors to establish robust partnerships
- Creates and manages a system of work-based learning opportunities
- Partners with community-based organizations

Source: Jobs for the Future (2015).

In addition to being a partner with Elk Grove in its own CCPT grant, Sacramento City benefits from a larger CCPT grant administered by the Sacramento County Office of Education to develop a work-based learning system on a regional scale supported by the intermediary group NextEd and an online job placement bank called LaunchPath. As with the new staff positions, these new organizations are still getting under way, building relationships and defining their role in the consortia. In particular, the regional intermediary has the potential to increase the number of high-quality experiences available to students. As one district staff member explained,

> [There are] really three tiers that we look at for work-based learning. We look at high-level CEOs [chief executive officers] who cause work-based learning to happen by shouting down the line, "Hey, make this happen," and who recruit other major industries to be involved in education.... A second tier is really more "boots on the ground" level so in any company that has a CEO that's said "We're going to get involved in education," the boots on the ground are the actual employees of the company who are doing the speaker days and hosting interns and doing the work. It's that level that we've tasked NextEd to be the intermediary for. What we wanted to do was to create a bank of opportunities because we know to take this to scale regionally we can't do it ourselves, we can't do it with our five career specialists and our five sector coaches, we can't even do it building the capacity of individual teachers in pathways—it has to be a regional engagement.

Although districts are making substantial progress on developing work-based learning *systems,* largely because of their CCPT grants, these systems are not yet fully operational and pathway teachers remain responsible for both securing work-based learning opportunities and integrating them into instruction. As a result, student access to quality work-based learning continues to be uneven.

As discussed, a priority for districts during the first year of their CCPT grant implementation—a self-identified planning year for most—was the hiring and training of additional work-based learning staff. However, at the time of data collection some of these individuals had not fully taken on the responsibilities of working with pathway staff to secure work-based learning opportunities for students. Moreover, in most districts the responsibility of the new staff ends at securing work-based learning opportunities, and teachers are left to determine how to integrate them into their instruction, with minimal support. Thus, the quality and quantity of work-based learning opportunities continued to vary greatly across pathways and largely depended on the strength of individual teachers' connections and their ability to dedicate additional time to securing the opportunities, establishing relationships with industry partners, and working with other pathway teachers to integrate the experiences into cross-curricular academic projects. One teacher described the challenge of taking on this additional role in the context of existing responsibilities:

> [The district has a work-based learning coordinator] at the district office…but I have yet to see him do anything for us. In fact, usually he'll say, "Why don't you guys go contact…?" No. We are teaching five periods a day, we are working a full-time job. When do you think that is going to happen?

In districts with newly identified regional intermediaries, such organizations will eventually take on the role of developing and maintaining a system of work-based learning opportunities with the goal of ensuring a broad offering of high-quality experiences for students across the continuum (career awareness through career training). In the short-term, however, most districts continued to provide scattered work-based learning opportunities concentrated at the lower end of the continuum (career awareness and career exploration), such as listening to guest speakers. Districts continued to struggle with offering opportunities for all pathway students at the higher end of the continuum, namely, job shadows and paid or unpaid internships.

Further, work-based learning staff generally lacked time and in some cases training to assist pathway staff with integrating work-based learning into curriculum and instruction, leaving pathway teachers to shoulder this task without support. Sacramento City's solution to this problem was to hire industry-specific sector coaches to directly support teachers in integrating work-based learning into the curriculum. Although all sector coaches had been hired, however, most were still learning how to do their job and had not yet been able to provide teachers much direct assistance. To the extent that they were able to provide assistance in 2014–15, sector coaches concentrated on the least developed pathways, leaving the more advanced pathways with limited supports and with little sense that they were benefitting from the regional work. Going forward, Linked Learning staff will need to determine how to best differentiate the support these new staff provide given the varying levels of development with work-based learning in the pathways. They may find it challenging to effectively support work-based learning in the more advanced pathways at first given that pathway staff have more expertise and depth of experience with it than they do.

Although many districts are capitalizing on new funding sources to support the development of work-based learning systems, districts with more limited funding allocations have yet to develop plans for sustaining work-based learning supports.

Although all nine initiative districts were awarded first-round CCPT grants in spring 2014, they did not receive the same amounts. Some districts were the primary fiscal agent for their region, whereas others were more peripheral partners in large multiplayer consortia. In some districts, the amount of CCPT funding was insufficient to offset other budget cuts. For example, Pasadena received limited funding from the first-round CCPT grants (mostly dedicated to efforts to improve postsecondary transition supports for students) and faced the possibility of losing $2.5 million in district Regional Occupational Program (ROP) funds. Amid plans to continue growing the number of pathways while concurrently controlling costs, the

district had to devise a new model for supporting work-based learning. Pasadena stretched its existing funds for work-based learning by replacing two part-time business liaison positions with three part-time external contractors, known as Pathway Industry Connections (PICs). The PICs assumed responsibility for assisting each pathway in making connections with local industry partners to provide work-based learning opportunities. Pasadena has been savvy about using what funding it has, but its participation in a first-round CCPT grant did not help to lessen the precarious nature of support for work-based learning. Similarly, Antioch has not received enough CCPT funding through its participation in the Diablo Gateways to Innovation Consortium to bolster supports for work-based learning. The county office of education is the fiscal agent, and Antioch is one of 12 school district partners. District staff in Antioch acknowledged that with the end of Irvine Foundation funding it did not have a plan to maintain its two work-based learning coordinators—the sum total of district-level support for work-based learning—at the end of the 2014–15 school year.

As districts continue with CCPT implementation and the development of work-based learning infrastructure, it remains to be seen how newly awarded second-round CCPT grants, YCC funds (for Los Angeles), and additional regional development funds will affect the sustainability of their efforts. For example, Pasadena was awarded a second-round CCPT grant as the primary fiscal agent. This new funding may enable the district to sustain or expand its system for work-based learning even if the district loses ROP funds.

District and Postsecondary Collaboration

In addition to developing work-based learning systems, a primary goal of both the CCPT and YCC grant programs is to bring secondary and postsecondary partners together to collaboratively work on reducing the barriers to students' transitions from high school to college. Interviews with Linked Learning graduates and community college administrators suggested that strengthening the support for students during this critical transition could improve their chances of enrolling in college and having a successful experience once they have matriculated. Academically, pathway students generally feel prepared for college, but they are less sure about other aspects of college life. Students are scared about leaving home, are concerned about how they will pay for college, and wonder how they will cope with self-direction. Students realize that the support systems they relied on in high school may not be available to them in college. A student in a health pathway explained,

> I think I will have trouble trying to navigate my way through a bigger school. I'm used to teachers pushing me and having support. But in academic ways, I feel prepared to take on academics. [It's] just a matter of being connected to teachers and professors.

Similarly, a student commented, "On paper we are prepared and we know what we need in terms of how many years of education…and skills to make connections and that type of stuff. After that it is chance."

Interviews with K–12 and college educators also indicated that pathway students may not have all the self-regulatory skills to be fully prepared for college (e.g., ability to study, manage time, set and achieve goals). A pathway coach talked about the need to provide students with the skills to deal with the demands they will face in college:

> It's those academic areas of written and oral communication. How are students writing and presenting their work? Then the soft skills. How do they manage their time? How do they persist once they are there [in college]? How do they navigate the system once they are there? We do a good job of getting students into the door of the colleges. The next step is how they do once they are there. We had a former all-star student…who is at UCSD [University of California at San Diego] at present who said she is getting Ds and Fs because she works 40 hours a week and has so much going on. How do we help them balance all those demands?

Districts are using grant resources to initiate or deepen K–12 and postsecondary partnerships.

In some districts, the groundwork for these efforts had already been laid through Foundation funding for the California Community College Linked Learning Initiative (CCCLLI). Facilitated by the Career Ladders project, the CCCLLI program was designed to serve as a demonstration of extending Linked Learning pathways from high school into college. CCCLLI grants were awarded in both 2012 and 2014 (see Exhibit 2-3). For each grant, the Career Ladders Project chose a community college to serve as the hub for CCCLLI model development and implementation. Hub colleges were responsible for partnering with other community colleges and a local Linked Learning K–12 district or pathway to work together to improve support systems for students' transitions to postsecondary education.

In this section, we describe how the combination of CCCLLI, CCPT, and YCC funding supporting regional collaboration has influenced the nine districts' relationships with their local postsecondary institutions as well as any progress on reducing the barriers to student transitions.

Exhibit 2-3
CCCLLI Grants to Linked Learning Districts

District/School	Hub Community College	CCCLLI Round 1 (2012)	CCCLLI Round 2 (2014)
Hollywood High School, Los Angeles Unified	Los Angeles Community College		✓
Oakland Unified	Peralta		✓
Pasadena Unified	Pasadena City College	✓	
Health Professions High School, Sacramento City Unified	Sacramento City College	✓	
West Contra Costa Unified	Contra Costa College	✓	✓

The majority of districts made some progress on easing students' transitions to postsecondary institutions, either through creating new relationships or building on existing partnerships. Several districts indicated that one of the greatest successes achieved in the 2014–15 school year was improved collaboration with postsecondary institutions (primarily community colleges) supported by funding from a CCPT grant. In some cases, districts that had begun to build partnerships with their local community colleges through CCCLLI grants from the Foundation were able to continue to build on and deepen their work through their CCPT grants. For example, a CCCLLI grant helped Pasadena City College initiate a partnership with Pasadena Unified School District (PUSD), extend Linked Learning pathways into the college, improve student outreach and counseling, and expand summer bridge programs. These efforts were continued through CCPT grants with an added focus on expanding dual-enrollment opportunities. The positive and constructive nature of the current partnership between Pasadena City College and PUSD is a dramatic improvement over what had been a strained relationship before the regional grants. According to a PUSD staff member, "Two years ago we had no trust or relationship with our community college, but that has changed tremendously.... It's a true partnership." Similarly, as a Pasadena City College administrator explained,

> The best part of the project is that we have had ongoing conversations and mutual goals with our K–12 partners. Dual enrollment started the conversation at a very deep level for us to understand our student success data and to identify where we need to come together to help our students.

West Contra Costa Unified School District (WCCUSD) also used CCPT funding to continue the partnership with Contra Costa College that had been initiated through a first-round CCCLLI grant. With money from CCCLLI, Contra Costa College and WCCUSD focused on extending Linked Learning pathways in two industry sectors (health and law) through grade 16. In 2014–15, with CCPT funds, the partners tailored their efforts based on lessons learned and concentrated on expanding these transitional

pathways to other career themes. In addition, Contra Costa College and WCCUSD began working on creating a pipeline from law pathways to the college's Administration of Justice program. Students would then transfer to 4-year universities to complete their bachelor's degree and ultimately attend law school. As part of this initiative, WCCUSD and Contra Costa College have been working on creating dual-enrollment courses in the law academies. Both district and college administrators viewed creating the memoranda of understanding and instructional service agreements for these courses as a major success of the 2014–15 school year.

Districts that did not have the advantage of building on work initiated with CCCLLI funds also made progress in forging postsecondary partnerships in 2014–15. For example, Montebello began working on articulation agreements with two local colleges for the first time. In Porterville, counselors from Porterville College visited district high schools in the spring to provide seniors who were planning to enroll with a general orientation. They helped the students with placement and matriculation requirements, including taking the placement exam, submitting their application, and completing their financial aid documents. Building relationships between K–12 and postsecondary institutions takes time, however, and the districts that are only now beginning to work with postsecondary partners are far behind those that have been developing and expanding their partnerships for several years, whether through CCCLLI or on their own initiative.

Dual-enrollment courses enable Linked Learning students to earn college credits while still in high school with no tuition costs. Although dual-enrollment opportunities remained limited, districts are working with postsecondary partners to expand their availability.

According to the ConnectEd (n.d.) definition of a pathway program of study, one requirement is that all pathway students be offered the opportunity to earn postsecondary credits. One way to satisfy this requirement is through dual-enrollment courses. Research suggests that career-focused dual-enrollment programs can provide important benefits for low-income and underrepresented students in higher education: those who enroll in dual-enrollment programs are more likely to transition to a 4-year college (rather than a 2-year college), are less likely to take basic skills courses in college, and are more likely to persist in postsecondary education than comparison students (Hughes, Rodriguez, & Edwards, 2012; Struhl & Vargas, 2012). Some district and pathway staff have begun to view dual-enrollment courses as more advantageous than Advanced Placement (AP) courses because dual enrollment does not require students to pass an exam to receive college credit. Dual enrollment also has the advantage of helping high school students view themselves as college material and offers financial benefits if they can accumulate a significant number of college credits before they begin to pay college tuition costs—an important advantage for high-need students. A health pathway student talked about college classes preparing him for the rigor of college work: "It's going to be very hard, and we have to be prepared for the challenges. I feel like taking the college class better prepared me for college. [It] provided insights into what college life is about."

Dual Enrollment and Dual Credit Defined

Dual-enrollment programs enable students to simultaneously enroll in high school and college courses, often earning both high school and college credit (dual credit) for the same course. Dual-enrollment programs may involve courses offered for college credit at either the high school or college campus.

In this report, we use *dual enrollment* to refer broadly to the effort to expand opportunities for students to earn college credit while in high school and *dual credit* to refer to courses offered at the high school campus for which students can earn both high school and college credit. Our use of the term dual credit does not include Advanced Placement and International Baccalaureate courses, for which many colleges and universities require particular score levels on standardized course exams in order for students to earn college credit.

In 2014–15, increased grant funding supporting local and regional partnerships enabled district staff to begin working with postsecondary partners to create more dual-enrollment opportunities. For example, through the Sacramento Pathways to Success partnership with Sacramento City College and Sacramento State, Sacramento Unified worked to increase dual-enrollment opportunities for its high

school students. A pathway lead commented that getting students some college credits while they are in high school is a priority so that "students start seeing that yes I can do this (earning credits) because we are talking about 95% or more who will be the first generation [of their family] to go to college and to them it's scary." In Oakland, students at the Computer Science and Technology Academy will have the chance to earn an associate's degree at Berkeley City College before they graduate from high school under a new program starting in fall 2015. A $400,000 grant from software company SAP will help with curriculum development, policy, schedule integration, data sharing, and academic support services. SAP will also offer mentors and job shadowing opportunities.

Regional consortia have made progress in removing some of the bureaucratic and policy barriers to students' transitions from K–12 to postsecondary systems. Many barriers remain, however, some of which will require legislative or statewide policy action to remove.

Although initiative districts made some progress in expanding dual-enrollment opportunities in 2014–15, bureaucratic and policy barriers hindered dramatic increases. Regional consortia have begun to collaborate to remove some of these barriers. For example, a common weakness of articulation agreements between K–12 districts and community colleges is that they are honored only by the specific community colleges that signed them. With state and federal funding for regional partnerships, a few districts began creating regional memoranda of understanding that would allow students to receive credit for courses at multiple community colleges in the region. For example, Long Beach used CCPT grant funds to expand on its already strong relationship with Long Beach City College and Long Beach State University to include other local community colleges. District and postsecondary staff are trying to work out a regional articulation process for engineering pathways that would allow students to receive credit for courses at community colleges in the region in addition to Long Beach City College. As a district staff member explained,

Barriers to the Expansion of Dual-Enrollment Offerings

In California a number of institutional and policy barriers limit the expansion of dual enrollment, particularly for regional partners trying to quickly develop dual-enrollment courses across multiple subject areas.

- For a high school course to be approved for college credit, high school administrators must work with individual colleges to form articulation agreements, and the agreements may not be honored if students attend a different college. The California Community Colleges Chancellor's office requires that an extensive memo of understanding be established for all new dual-enrollment classes, and approval takes 2 to 3 years.
- The Chancellor's Office issues minimum qualifications for community college faculty, which include a master's degree in the discipline for most subjects. These requirements hold for college credit-bearing courses regardless of where they are taught. High school teachers usually have a master's degree in education but not as commonly in the discipline they teach. If high school teachers do not meet these criteria, districts must seek college faculty to teach dual-credit classes; some districts have found college faculty to be disinclined or ill-prepared to teach high school students.

> I think it's going to be huge if we can get this regional articulation plan in place. That is a daunting task. Every community college is different. Being able to break down those barriers to make things more fluid will make things fabulous for students. It's not just you took this course and you have to go to a specific community college. They [students] aren't limited [to attending one college] to get those credits. It's opening up options for our students.

Los Angeles Unified also capitalized on its CCPT and YCC grants to work with all nine community colleges in the Los Angeles Community College District on establishing articulation agreements and creating dual-enrollment courses. Los Angeles pathways and schools involved in the YCC grant made a commitment that all students in the class of 2017 would have six units of college coursework when they graduate, either through articulated courses or dual enrollment. Los Angeles Unified also tried to be strategic about the development of dual-enrollment courses. It organized meetings with instructors from the high schools and colleges to discuss the spectrum of competencies they should be teaching. Ultimately, the goal is to identify the certificate or degree needed for specific career areas and then work

backward to identify the classes that must be taught and to determine whether they should be taught by a high school or college instructor.

In addition to steps that regional consortia have taken, state legislation passed in fall 2015 (Assembly Bill 288) authorizes the governing board of a community college district to enter into a College and Career Access Pathways partnership with the governing board of a regional school district with the goal of developing seamless pathways from high school to community college. By establishing partnerships between school and community college districts, this legislation makes it easier for school districts to be able to offer dual enrollment courses with multiple local community college partners. Within the partnerships, this legislation has reduced barriers to dual enrollment by raising the per-semester cap on dual enrollment for students working toward both a high school diploma and an associate's degree from 11 to 15 units. The bill also provides greater flexibility for K–12 and community college districts to establish or expand dual-enrollment programs that allow high school students to work toward their high school graduation and take part in college-level CTE courses or classes that count for credit toward a degree. AB 288 also authorizes community college faculty to teach remedial courses at high schools to students who lack proficiency in math or English based on 10th- or 11th-grade standardized tests. The goal of this legislation is to allow for the creation of more programs like Long Beach College Promise, which substantially increased the number of students from Long Beach Unified who are college ready in English and math. The legislation gives K–12 districts and community college districts broad authority to establish their pathway program in a way that best suits their local needs through the establishment of partnership agreements. These agreements must specify protocols for sharing student data, joint facilities use, parental consent, enrollment priority, teaching assignment, and how funding for students will be allocated between the community college district and the school district. Thus within the partnerships, AB 288 should help clarify the procedural requirements of dual-enrollment programs that can limit access to dual credit courses, such as course fees and restricting admission to classes offered on a high school campus.

Although progress has been made at both regional and state policy levels, further increasing the number of dual-enrollment opportunities for pathway students will require assistance from organizations such as the Linked Learning Alliance to work with staff at the Chancellor's Offices of the California State University (CSU) and Community Colleges and the UC Office of the President to remove institutional roadblocks such as the lengthy postsecondary approval timeline for new dual-enrollment classes. Institutional barriers such as this are beyond the power of regional consortia to remove and will require statewide policy action.

Community college staff are beginning to take steps to implement alternative placement criteria and shorten the remediation timeline.

Some of the initiative districts and their postsecondary partners have begun working on the critical issue of how colleges determine students' readiness for college-level work through college placement testing and how long students spend in remedial coursework before they start earning college credits. Placement in remedial coursework can be a significant impediment to students' successful transition to college because remedial courses are generally not credit bearing. Half of all undergraduate and 70% of community college students take at least one remedial course. The majority of those students will fail to eventually earn a credential. Placement tests may be part of the problem. A 2012 study by the Community College Research Center at Columbia University's Teachers College (Belfied & Crosta, 2012) found that large numbers of students are placed into remedial courses unnecessarily. For example, among two large samples of community college students who were deemed to have remedial needs based on standardized placement tests, up to a third could have passed college-level classes with a grade of B or better. This research also found that high school grade point averages (GPAs) are better predictors of student success than placement tests.

These research findings have encouraged experimentation by colleges such as Long Beach City College to use multiple measures of student achievement to determine the need for remediation; Long Beach City College has had great success in using high school achievement (e.g., GPA) rather than traditional standardized tests to increase the number of students capable of succeeding in college-level courses who are placed in credit-bearing rather than remedial courses. The program also substantially increased

the number of students who completed key early educational milestones in their first 2 years of college, including successful completion of transfer-level English and math. Several of the colleges we visited in 2014–15 were similarly experimenting with multiple measures to place incoming students in their initial course levels or were creating accelerated remediation programs. Pasadena City College was piloting accelerated remediation in English and created alternative math courses for liberal arts pathways; Contra Costa College was developing accelerated math programs and piloting use of multiple measures for math placement; Porterville College has begun including counselor and faculty input for student placement decisions in addition to test scores.

The use of multiple measures in California's community colleges may get a boost from a state initiative to use high school transcripts and GPAs more broadly across the system's 112 campuses. In 2014, the state of California provided $8 million to launch the Common Assessment Initiative to create a centralized placement platform that will factor in multiple measures. This type of experimentation with alternative placement criteria has the potential to reduce barriers to student success in postsecondary institutions. To date, however, it has mostly happened only at the community college level. The CSU system has statewide placement testing guidelines, making it difficult for individual institutions to establish alternative placement criteria.

Challenges to Regional Collaboration

Participation in the regional approach provided districts with much-needed support in developing work-based learning infrastructure and fostering partnerships with postsecondary institutions; nonetheless, regional partnerships have also encountered obstacles in this first year of implementation that they must overcome to be successful.

Regional efforts through the California Career Pathways Trust grant have opened up conversations about successful work-based learning strategies and strengthened relationships with regional partners, yet for some districts aligning expectations across partners remains a challenge.

CCPT grant activities have made the development of regional work-based learning systems a focus for the nine districts. Engaging in regional consortia has the potential to reduce the burden on individual school districts by allowing for multiple partners to share in developing work-based learning opportunities. Before regional consortia can operate effectively, however, they must first define each organization's role and align varying expectations across multiple partners. Arriving at this type of alignment has been a challenge in some consortia. For example, in Los Angeles the lead intermediary organization, the United Way of Greater Los Angeles, coordinates with Linked Learning staff to leverage their resources for work-based learning, including CCPT and YCC grant funds. Together with the district, the United Way brought in several other organizations as industry-specific intermediaries charged with developing work-based learning opportunities in their sector. The consortia hired 10 new work-based learning coordinators, housed either at the district or at the industry-specific intermediaries. Because they are housed at a variety of different organizations, the work-based learning coordinators have struggled with varying role expectations, and some cited the lack of clarity as a particular challenge in this first year.

A staff member at one consortium partner described the challenge thus:

> [The district] should not house work-based learning coordinators because what we found all year is that even though we said here's the scope of work, which intermediaries are contractually obligated to supply, the district doesn't necessarily think that those outcomes really apply to their staff, and their staff are working on all kinds of stuff. One of the work-based learning coordinators told me the other day that his main role at one of the pathways is instructional advice, which I was, like, but you have a coach, so that was really weird.

The ability of regional consortia to improve their systems for offering work-based learning experiences and supporting students' postsecondary transitions is hampered by their lack of access to student-level longitudinal data.

To support informed decisionmaking in the priority areas of work-based learning and postsecondary transitions, regional consortia need access to two types of longitudinal student data. First, they need to create a system for tracking pathway student participation in work-based learning that captures the range of experiences that students are exposed to, such as the number of guest speakers and job shadows, as well as whether students had an internship and whether it was compensated. Second, they need to be able to track pathway graduates into postsecondary institutions so they can identify the barriers to successful transitions and create targeted supports. In addressing these two data needs, regional consortia confront different challenges.

The responsibility for tracking students' participation in work-based learning experiences falls largely on the K–12 school districts. Districts already have complex student information systems for tracking academic outcomes; the challenge is in adding work-based learning metrics to them and identifying pathway staff to enter the data into the system. Two districts, Porterville and Pasadena, continued to lead the way in implementing a system for collecting information on student work-based learning experiences across all pathways. For example, students in Pasadena write on a piece of paper how many hours of work-based learning they participate in, and school-based ROP technicians input the information in an Excel spreadsheet. Pathway and district staff then use the data to track the number and types of work-based learning experiences for each student. They also use the data to track student accumulation of work-based learning hours necessary to earn a medallion, which signifies pathway graduation. Porterville has the most extensive district system for tracking work-based learning experiences. It requires a minimum level of work-based learning for all pathway students and tracks three activities at the individual student level: resume preparation in 10th grade, mock interview in 11th grade, and internship in 12th grade. These activities are recorded in the AERIES student management information system. Although several of the other seven districts have begun to pilot systems, as of the 2014–15 school year none had systems in place that could consistently track student work-based learning participation across all pathways in the district. One promising step is that the Institute for Evidence-Based Change is working with staff at AERIES to add measures of work-based learning to its standard student management information system. This would help to standardize work-based learning metrics across school districts.

The second data challenge that regional consortia confront is the difficulty in linking K–12 district data with data from the different types of postsecondary institutions that pathway graduates attend. California does not have a state longitudinal system that includes the three public postsecondary systems, making it difficult to track students' postsecondary outcomes. As it stands, each higher education institution needs to develop a data-sharing agreement and procedure with each K–12 district that feeds students into the community college or university. Although regional consortia can facilitate this by building partnerships between secondary and postsecondary institutions, it would be much simpler if the state created a pre-kindergarten through postsecondary (P–20) longitudinal data system. California has already invested in developing a K–12 data system and the state's public higher education institutions also have extensive data systems. But progress in combining these systems into an integrated P–20 data network has stalled (Warren & Hough, 2013). Lacking a state database, Cal-PASS Plus, an initiative of the California Community Colleges Chancellor's Office, houses the most comprehensive longitudinal data system for the state but does not include indicators of students' high school pathway or program, making it difficult to assess the impact of pathway participation on postsecondary outcomes.

Turnover in leadership undermined some districts' ability to engage earnestly in the regional efforts and in the development of work-based learning.

Stability in high-level district leadership (e.g., superintendent, Linked Learning director) remains a critical component of effective Linked Learning implementation. Turnover in the highest levels of district and Linked Learning leadership during this first year of CCPT grant implementation made it difficult for some districts to engage in the regional work and move efforts forward as planned. With turnover, new leadership needs time to become familiar with the Linked Learning approach. In some settings, this orientation process detracted from districts' full participation in the regional work. For example, in the

wake of the former Linked Learning director's recent departure in one district, the new director was still settling into his new role and had not yet had a chance to engage with the CCPT work or the regional consortia. At this point, the district's involvement can be characterized as tenuous at best, and it is not yet clear how the district's participation in the CCPT-funded consortia will provide adequate funding for it to sustain the development of work-based learning opportunities.

Equally critical in the acclimation of new leaders to the Linked Learning approach is ensuring that they understand the vision for work-based learning. For example, in one district new district leadership planned to transform CTE specialists—previously housed in the Linked Learning office and responsible for supporting work-based learning at the school sites—into college and career specialists housed in a separate district office focused on postsecondary readiness. This reorganization would directly undermine the role of CTE specialists in supporting work-based learning as distinct from general postsecondary readiness.

Implications

New state and federal grants supporting the development of regional partnerships to expand work-based learning and build partnerships between K–12 school districts and postsecondary institutions, particularly the CCPT grants, have allowed many of the initiative districts to make progress on developing work-based learning systems and reducing the barriers to students' transitions to postsecondary institutions. However, 2014–15 served as a planning year for most districts during which they focused on building relationships, hiring and training staff, developing intermediaries, and getting systems in place. Consequently, this work has unfolded slowly and for the most part has not yet affected pathways students' experiences.

How these regional systems will affect students' work-based learning experiences in the nine districts remains to be seen. With work-based learning experiences currently depending in large part on teachers' individual connections and efforts, ensuring the quality and equity of the experiences both within and across pathways will be an important focus area as partnerships continue to develop regional work-based learning systems.

As the nine initiative districts hire new staff and continue to participate in broader regional efforts with partners not steeped in the Linked Learning approach, district leadership will need to work to maintain the purity of the Linked Learning approach to work-based learning, going beyond simply providing the learning experiences to fully integrating them into instruction. ConnectEd or internal Linked Learning coaches can be valuable assets in this endeavor by training new staff in the approach. Also, as the Foundation expands its regional hub work and the regional consortia become more complex, with regions increasingly blending multiple funding sources, partners will need to ensure alignment of their various funding streams in moving forward the primary goal of improved student outcomes. In such cases, a strong and trusted intermediary organization can help coordinate all the regional partners. Collaboration time for partners to meet and align their respective goals and clarify their roles and responsibilities can also prove invaluable in establishing a strong foundation for expanding regional work-based learning systems.

Regional collaborations have made progress both in enhancing students' college readiness by implementing more dual-enrollment classes in pathway courses of study and in reducing the barriers to students' transition to postsecondary institutions. They have implemented alternative placement criteria for remediation in community colleges and increased the availability of transition support services such as counseling and summer bridge programs. But the regional partnerships require assistance from outside organizations and state-level policymakers to address the institutional barriers to the development of dual-enrollment courses, the adaptation of CSU placement practices that rely solely on achievement tests, and the creation of a pre-kindergarten through postsecondary (P–20) longitudinal data system.

Chapter 3: Building Sustainable Linked Learning District Systems

Key Findings

- Districts are actively working to ensure the long-term sustainability of Linked Learning by establishing distributed leadership structures.
- Districts that have had longevity in key district leadership positions are making steady progress in institutionalizing Linked Learning.
- Some districts are solidifying their long-term commitment to Linked Learning by shifting from reliance on grant funding to use of general funds to support key Linked Learning leadership positions, integrating Linked Learning into the district's Local Control Accountability Plan, or integrating Linked Learning within districtwide curriculum and instruction improvement efforts.
- Districts have secured new funding sources, which are helping strengthen Linked Learning regional partnerships and infrastructures in support of improved dual-enrollment and work-based learning opportunities.
- Linked Learning directors are developing strategies to deal with inconsistent quality in pathway implementation as a way to support sustainability of Linked Learning.

In Chapter 2, we examined the influence of the regional expansion efforts on the initiative, especially on districts' development of work-based learning systems. We now turn to districts' progress in developing leadership, securing funding, integrating Linked Learning into district policies and priorities, and focusing on pathway quality to support and sustain Linked Learning beyond the Foundation's grants. Stable and distributed leadership, core funding, institutionalization of Linked Learning systems and practices, and quality assurance in pathway implementation form the foundation for Linked Learning sustainability.

In this chapter, we first describe districts' progress in establishing distributed leadership structures and the advantages that leadership stability is providing for institutionalization of Linked Learning. Next, we discuss districts' efforts to shift support for Linked Learning to general funds, followed by the implications of other new funding sources for sustainability. Changes in accountability systems are also supporting the sustainability of Linked Learning as districts integrate it within their Local Control Accountability Plan (LCAP). Finally, we describe integration of Linked Learning in districtwide efforts to improve curriculum and instruction and the renewed focus on ensuring consistent quality in Linked Learning pathway implementation.

District Leadership

As discussed in previous evaluation reports, district leadership plays a key role in ensuring the sustainability of Linked Learning. In this section, we highlight the creation of distributed leadership systems as a way to foster broad-based ownership of the initiative and long-term sustainability. We then discuss factors that facilitated distributed leadership across the districts.

The concept of distributed leadership has been around for perhaps as long as 70 years. Prominent education researchers (see, for example, Elmore, 2000; Gronn, 2002; Leithwood, Seashore Louis, Anderson, & Wahlstrom, 2004; Spillane, Halverson, & Diamond, 2000) have sought to study the concept and unpack its components to establish a grounded theory of distributed leadership; this remains a work in progress. Early in the implementation of the initiative, one partner—the Stanford Redesign Network (2010), now known as the Stanford Center for Opportunity Policy in Education—issued the Knowledge Brief "Distributive Leadership in District Reform: A Model for Taking Linked Learning to Scale." The brief

suggested that enough is known about the practical value of distributed leadership to make it essential for growing and institutionalizing a districtwide reform approach such as Linked Learning. This Knowledge Brief used the Long Beach case as its proof of concept; Long Beach has had a long and sequential history of systemic district reform efforts that predated the initiative and included strategies for both top-down and bottom-up leadership. In the context of this evaluation, it quickly became clear that distributed *ownership* of Linked Learning both facilitated problem solving during implementation and protected the reform in the face of leadership turnover. That is the very practical lens through which to view distributed leadership in the analysis reported here.

Districts are actively working to ensure the sustainability of Linked Learning through establishing distributed leadership structures.

Some districts are supporting the long-term sustainability of the initiative with distributed leadership structures that create widespread ownership of the Linked Learning approach. Establishing distributed leadership structures ensures sustainability of the initiative through leadership transitions and promotes districtwide buy-in for Linked Learning. Porterville has implemented a leadership system that is both centralized and distributed. The Linked Learning director created a strong team of district Linked Learning staff who worked directly under her, including two pathway coaches and two work-based learning coordinators. Long Beach created a Linked Learning Instructional Leadership Team to foster support for the initiative throughout the district by involving relevant stakeholders. For example, the director of high schools, who is responsible for principal professional development, was added to the Linked Learning Instructional Leadership Team this year. Adding key district personnel to the team helped distribute responsibility for Linked Learning implementation across multiple departments within the district. Distributed leadership in these two districts also facilitates problem solving when implementation issues arise and will ensure that institutional knowledge of the initiative remains in the district in case of key personnel turnover.

Although Long Beach and Porterville represent the most mature examples of distributed leadership within the initiative, other districts understand the value of broadening the leadership umbrella for the reform and have taken steps in that direction. In Los Angeles, for example, the former Linked Learning director (who now oversees much more than Linked Learning) led a large multifunctional team at the district office and chaired an instructional leadership team that met every two weeks to work on issues like how to conduct instructional rounds or observations. Similarly, in Sacramento, the Linked Learning director reported efforts to make Linked Learning more integrated through collaboration with coordinators of curriculum and instruction: “The goal is shared responsibility for Linked Learning, to share the responsibility of championing the approach.”

In some districts, however, leadership of Linked Learning remained concentrated under the Linked Learning director. Consolidation of leadership and decisionmaking authority has prevented additional stakeholders, such as other district leaders and pathway leaders, from taking ownership of the initiative. The effect of this has not been lost on observant colleagues. For example, an assistant superintendent in one district implied that the Linked Learning office could operate more efficiently by asking for assistance as needed and leveraging the expertise of other departments, rather than centralizing control under one office. In another instance, the director’s solo and preemptive style derailed a burgeoning community of practice among pathway Linked Learning leaders when the director co-opted their meetings with his own agenda.

Thinking about distributed leadership for Linked Learning should not be limited to the involvement of colleagues affiliated with the departments of curriculum and instruction or CTE. Districts that have succeeded in distributing leadership of the initiative have been mindful of its implications for other departments and personnel. Although Linked Learning is a high school reform strategy, it does not affect just high school teachers. For Linked Learning to be implemented effectively and comprehensively, districts tend to involve human resources personnel, professional development providers, coaches, and counselors, among others. In some districts, strategic planning across district departments led to the creation of distributed leadership structures. For example, Long Beach was able to ensure the buy-in of relevant stakeholders by explicitly involving staff from multiple departments on its Linked Learning Instructional Leadership Team.

Districts that have experienced longevity in key district leadership positions are making steady progress in institutionalizing Linked Learning.

Stability among high-level district leaders, including superintendents and Linked Learning directors, has facilitated the development of distributed leadership structures. In Porterville and Long Beach, longevity in district leadership has enabled the Linked Learning teams to foster buy-in for the initiative and institutionalize Linked Learning as the districts' major high school reform approach. As a result, Linked Learning staff were able to spread support and responsibility for the initiative across multiple departments and stakeholders. Thus, there appears to be a direct relationship between leadership stability and success with distributed leadership structures within this initiative. In Los Angeles, the continued steady progress of Linked Learning generally and distributed leadership in particular despite leadership turnover can be attributed to the fact that Superintendent John Deasey was replaced by former Superintendent Ray Cortines, who had originally introduced Linked Learning to Los Angeles District 4.

According to a survey by the Council of Great City Schools in 2013–14, the average tenure for superintendents of urban school districts was 3.2 years (Will, 2014). The initiative is now 7 years old. It is therefore not surprising that several Linked Learning districts have experienced change in top leadership at least once. Leadership change will not necessarily dislocate implementation of Linked Learning, but it does often have a disruptive effect. For one thing, Linked Learning leaders must inevitably take time to educate new executives about Linked Learning as a high school reform approach. This can be a lengthy process, because Linked Learning is nuanced and has a unique implementation history in each district; new leaders need this background knowledge in order to incorporate Linked Learning into their own educational improvement plans. During 2014–15, four districts in the initiative had new superintendents. Interviewees in those districts noted that these leaders verbally committed to sustaining the implementation of Linked Learning, but in two of the districts veterans of the Linked Learning initiative reported with some frustration that progress had slowed. In one case, the new superintendent's organizational changes may actually set Linked Learning implementation back a year or two. In the other district, the new superintendent is leery of what he perceives to be the extra expense of pathways—a segue to discussion of another critical factor to the sustainability of Linked Learning: funding.

Funding

The sustainability of Linked Learning will rest not only on stable and consistent leadership support, but also on stable and consistent funding. At this stage, districts are well aware of the costs associated with implementing and sustaining a high-quality system of Linked Learning pathways. Among these costs are the need to provide pathway lead teachers with release time for planning and coaching, release time for pathway teachers to collaborate on integrated projects, and support for expanded work-based learning opportunities, including possible transportation costs. Further, most of the districts in the initiative have come to place a high value on various kinds of coaches, especially if individuals can be dedicated to the role full time. In addition, there are administrative costs associated with master scheduling to maximize the effectiveness of student cohorts, documenting student participation in work-based learning opportunities, and self-assessment of continuous improvement at the pathway level. Ideally, we should be seeing a transition from Linked Learning as primarily a grant-funded activity (with emphasis on funding from the Foundation) to core support for it from district general funds. New grant funds are helping districts build infrastructure to sustain Linked Learning. In addition, some districts have already taken an important step by shifting the support of key Linked Learning staff to general funds.

New funding sources are helping districts strengthen Linked Learning support systems, particularly for expansion and improvement of work-based learning and dual-enrollment opportunities.

The participation of Linked Learning initiative districts in CCPT regional and local grants (described in Chapter 2) will probably have important impacts on long-term sustainability. Although it is still too soon for districts to have experienced the full benefit of the infrastructure development funded by the CCPT grants, it promises to support quality and sustainability of the work-based learning component for all districts in the initiative. Additional support for work-based learning infrastructure and ties to industry is also likely

from the federal YCC grant in Los Angeles and the Atlantic Philanthropies Health Career Pathways[13] grant to Oakland. The CCPT grants are also supporting development of dual-enrollment systems for Pasadena, Los Angeles, and West Contra Costa. In this way, the CCPT grants are enhancing and solidifying partnerships between these districts and postsecondary partners, enhancing the sustainability of this important aspect of Linked Learning implementation.[14]

Local funding initiatives are also likely to promote the sustainability of Linked Learning. Two of the initiative districts passed local ballot measures that will provide long-term support for Linked Learning. Pasadena passed Bond Measure TT to support building of college and career centers in all district middle schools. In November 2014, Oakland voters passed Measure N, known as the Oakland College and Career Readiness for All Act, signaling the community's support for Linked Learning. The measure allows the district to collect a parcel tax of $120 on each individual parcel within the district's boundaries. The funds can be used to increase support for students in college prep classes; to provide work-based learning in every high school; to provide counseling, tutoring, mentoring, and other intensive support services to reduce the dropout rate; and to provide programs that support eighth- to ninth-grade transitions and high school to college transitions. Measure N funds will become available to the district in fall 2016. Until then, the district plans to use bridge funds from two grants (a College and Career Pathways Trust Grant and the Health Career Pathways Grant from the Atlantic Philanthropies) to hire four to six pathway coaches to support pathway quality.

Some districts are beginning to shift from reliance on grant funds to support key elements of Linked Learning to more sustainable funding sources.

One important indicator of a district's long-term commitment to sustaining Linked Learning is the shift from using grant money (that will inevitably run out) to using general funds to support key Linked Learning staff positions. General funds consist of monies from both local and state sources, such as taxes. Some districts have taken steps to institutionalize key Linked Learning positions and services at both district and school levels within the regular district budget. For example, this year, for the first time, Sacramento shifted to general funds the salaries of the Linked Learning director and Linked Learning coordinator and part of the salaries of the work-based learning coordinator and an assistant. Similarly, Los Angeles switched from grant funds to general funds to cover the Linked Learning director position and several other district-level support staff.

In addition, in 2014 California implemented the Local Control Funding Formula (LCFF), a new strategy for distributing public education funding from the state to localities. The LCFF allocates funds to districts based on average daily school attendance, with greater weight given to certain grade levels and targeted groups of high-needs students. The formula consolidates many formerly separate categorical funding streams. In addition to providing more funding to districts that serve large proportions of high-need students, the shift to the LCFF provides districts greater control over the use of funds. The LCFF requires districts to develop 3-year Local Control Accountability Plans (LCAPs) that identify goals and establish metrics for measuring progress toward them. The LCAP offers districts in the initiative an important opportunity to codify Linked Learning as a key district priority, as discussed in the next section, and provide local funds that could be used to support Linked Learning. Some Linked Learning directors have tapped into these funds. For example, starting in 2015–16, Long Beach will implement what it calls "a franchise fee" that directs high schools to allocate funds off the top of their LCFF money to support Linked Learning costs such as support services like instructional and CTE coaches, small learning community coordinators, and planning time for pathway leads. West Contra Costa set aside nearly $600,000 in LCFF funding for use at the pathway level, but we do not have specific information about how it will be used.

[13] In December 2014, the Atlantic Philanthropies awarded an $11 million grant to Oakland Unified School District and its partner, Alameda County Health Care Services Agency, to support enhancements to Linked Learning health care career pathways and related efforts to encourage Oakland youth to pursue health care careers.

[14] See Chapter 2 for a detailed discussion of work-based learning system building and the development secondary-postsecondary partnerships.

In general, the institutionalization of Linked Learning through transfer of its costs from grant to general funds is a theme that we will continue to track in subsequent data collections. Some of the smaller districts in the initiative currently seem to have more budgetary constraints and did not indicate how Linked Learning supports and services can or will be maintained when grant funding is no longer available.

Integrating Linked Learning into Key District Policies and Priorities

In this section, we discuss how districts are ensuring the sustainability of Linked Learning by integrating the initiative into key district policies and priorities. As noted, some districts explicitly incorporated Linked Learning into their LCAPs. Districts also worked to combine Linked Learning with their curriculum and instruction improvement efforts through three major strategies: (1) structurally integrating the Linked Learning and Curriculum and Instruction departments, (2) instituting formal systems that encourage collaboration, and (3) aligning the graduate student profile with Linked Learning outcomes.

Some districts are solidifying their long-term commitment to Linked Learning by integrating Linked Learning into the district's Local Control Accountability Plan.

As noted, districts are required to develop and annually update LCAPs as part of LCFF implementation. The LCAPs outline the district's overall vision for student learning, annual goals, future action steps to accomplish these goals, and measures for identifying progress. The LCAP offers an opportunity for districts to specify and thus help to sustain Linked Learning as a key element of broader district priorities and accountability structures. Indeed, one of the eight priorities that districts must address in their LCAP is access to courses to ensure students' college and career readiness, a priority that is a natural fit with Linked Learning.

This year, five districts signaled their long-term commitment to the initiative by explicitly incorporating the Linked Learning approach into their LCAP. The extent to which Linked Learning was positioned as a major reform strategy in each LCAP varied across the districts. For example, Los Angeles framed Linked Learning as an intervention rather than a major organizing model in its LCAP. In another district, the Linked Learning director noted a lack of "thoughtful collaboration" on the place of Linked Learning in the district's LCAP. The initiative was written into the district's first LCAP in fall 2014, but the new administration plans to rewrite it. The West Contra Costa LCAP included a commitment to performance assessments, a major component of the Linked Learning approach. The district created a 60/40 formula in which 60% of reporting of progress will be based on student test scores, and 40% will be based on performance assessments aligned with the graduate profile. Long Beach noted plans to expand Linked Learning in its LCAP by increasing the number of CTE courses and work-based learning opportunities.

Several districts are working to institutionalize Linked Learning by integrating the approach within ongoing curriculum and instruction improvement efforts.

During 2014–15, district leaders worked to integrate Linked Learning with overall curriculum reform efforts through three major strategies. First, they worked to structurally integrate Linked Learning with their curriculum and instruction departments to better align the initiative with the districts' instructional improvement strategies. Two districts physically moved the Linked Learning department under the district instructional umbrella. West Contra Costa moved Linked Learning from the K–12 School Operations department to the Educational Services department to coordinate the efforts of Linked Learning with districtwide instructional supports. District staff and pathway teachers both viewed this as a positive development. As one Linked Learning administrator stated, "Our leads feel a little less like they are being pulled in two separate directions." Los Angeles moved the Linked Learning office under the Curriculum and Assessment office this year, helping the initiative to become more centrally located within the district's infrastructure.

Three districts used a second strategy to integrate Linked Learning with curriculum and instruction: creating formalized systems that encouraged collaboration among the two staffs. This year, Porterville made the combination of Linked Learning and Common Core standards implementation a "blended priority." The district framed both efforts as promoting progress toward the district's overall goals of

college and career readiness. In its efforts to integrate work on the two initiatives, the district renamed the existing Common Core coaches as instructional coaches to emphasize that Common Core and Linked Learning are connected initiatives that both serve to improve instruction. In addition, the Linked Learning director and the assistant superintendent for curriculum and instruction began giving joint reports to the school board on college and career readiness. In Long Beach, the curriculum and instruction and Linked Learning offices continued to be technically separate, but the district implemented systems that resulted in considerable collaboration between the two. For example, the chief academic officer is a member of the Linked Learning Instructional Leadership Team, as are the curriculum specialists in math and English. As a result, curriculum specialists in Long Beach gained a deep understanding of the Linked Learning approach. The same leadership group is also part of the Common Core/Linked Learning steering committee to ensure that consistent messaging is being sent to all staff. Pasadena is the third district that encourages collaboration on Linked Learning and the Common Core, although with perhaps somewhat less intensity than in Porterville and Long Beach. Pathway coaches in Pasadena attend Common Core and departmental professional development meetings. Interviewees indicated that all the district's priorities at the secondary school level are aligned with the ultimate goals of Linked Learning, a fact well understood by administrators and teachers.

In a third strategy, some districts are also integrating the initiative with curriculum and instruction by aligning the graduate student profile with Linked Learning outcomes. This year, four districts (Los Angeles, Porterville, Antioch, and Sacramento) continued developing their graduate student profile, which outlines expectations of the knowledge and skills students should be able to demonstrate by graduation. Linked Learning directors in Antioch and Los Angeles led the development process and as a result were well positioned to advocate for the inclusion of college and career readiness outcomes aligned with Linked Learning. Some districts also worked to explicitly align the graduate profile with Linked Learning outcomes, such as project-based learning, student collaboration, and participation in work-based learning opportunities. For example, the Linked Learning director in Los Angeles mentioned using Linked Learning sites as models for the defense of learning and portfolio projects that will be included in the graduate profile. In addition, district leaders in Porterville have deeply integrated Linked Learning into the graduate student profile; in 2014–15, the district began tracking students' progress on the college and career readiness outcomes, including work-based learning experiences. The alignment of Linked Learning and graduate profile outcomes helps ensure Linked Learning's sustainability by embedding the initiative into the district's instructional priorities and deepening understanding of it across a broader constituency of educators.

Seven of the nine districts in the initiative used one or more of the strategies discussed above to align Linked Learning with planned reforms of curriculum, instruction, and/or assessment under the Common Core State Standards and related reforms such as the graduate profile. This is strong evidence that Linked Learning is becoming thoroughly institutionalized in the majority of the districts. The organizational churn associated with the changes in leadership in Oakland when we were collecting data in spring 2015 prevents us from commenting on how institutionalization will proceed there once the dust settles. Oakland has historically had difficulty situating Linked Learning for optimal integration with other secondary school improvement priorities.

Quality of Linked Learning Implementation

The relatively short time frame in which districts have planned and implemented systems of Linked Learning pathways has led to concern among Linked Learning leaders about uneven implementation quality. At some times and in some districts, rapid development of new pathways has created variation in pathway quality. High quality in pathway implementation is essential for the success of the Linked Learning approach. Most districts have now slowed expansion of Linked Learning, and all Linked Learning directors expressed a need to focus on deepening quality in existing pathways. Maintaining consistent and high quality in the implementation of Linked Learning pathways will be another critical foundation for sustainability

Linked Learning leaders agree on the value of slowing the pace of new pathway implementation to direct more attention to deepening pathway quality.

One Linked Learning director described the rapid expansion of Linked Learning pathways as a necessity to reach a "critical mass" to build support for and sustain the Linked Learning approach within the district. This director said that pathways need to reach a large enough segment of the student population that they are not seen as exclusive "boutique" programs or as special programs for at-risk students: "It needs to be large enough segment of your population so that it doesn't become 'Oh that's exclusive or that's for the have-nots.' It's in the fabric of the high school and the school community." At the same time, Linked Learning staff recognize that rapid development of new pathways within initiative districts, as well as the rapid expansion of Linked Learning to other districts through regional funding, has led to inconsistent implementation and low quality in some pathways. In addition, the community of practice formed by the nine initiative directors firmly supports the policy of slowing the pace of Linked Learning expansion so that more effective measures can be taken for consistent quality assurance in implementation.

A consensus exists among Linked Learning leaders in the initiative districts that a slower pace for pathway development and expansion is desirable and would promote more consistent quality in pathway implementation. Some districts are still actively pursuing goals to create new pathways and expand participation in existing pathways. For some districts, school board directives and/or funding sources mandate pathway expansion. However, even districts that are continuing with ambitious pathway expansion plans have an interest in slowing the pace of implementation and directing more attention to quality assurance.

The availability of funding from state, federal, and foundation sources to support regional expansion of the Linked Learning approach has caused concern among some leaders from initiative districts about the dilution of the Linked Learning "brand." They fear that poor implementation of pathways in some districts could lead to poor student outcomes and thus damage the credibility of the Linked Learning approach and weaken support and funding to sustain it.

One of the underlying assumptions of the regional expansion and scale-up of Linked Learning in new districts is that the initiative districts will serve as models and, in some cases, as guides and mentors to districts with less experience implementing Linked Learning. Although there is a strong case to be made for the validity of this assumption, it is also evident that taking on responsibility to mentor and guide other districts has sometimes strained the capacity of initiative districts to devote full attention to maintaining quality in their own Linked Learning system. A pathway lead teacher in one district voiced concern about the amount of time the Linked Learning director was spending on regional work. Specifically, she was concerned about the time needed to support high-quality Linked Learning implementation at the pathway level and the willingness of new teachers to make the needed time commitment:

> I wish we had a little more support from district. New teachers are not as willing to work beyond the time clock. [I have] nothing against [the Linked Learning director], but [the Linked Learning director] is not in the classroom and doesn't realize it is a domino effect on time.

Implications

A distributed leadership structure provides support for the long-term sustainability of Linked Learning by fostering broad-based ownership of the initiative and by engaging a broad range of district departments and leaders in the implementation process. Although leadership turnover is a constant threat to the initiative's sustainability, distributed leadership can help maintain continuity of the initiative.

It is too soon to say how well districts will be able to shift from funding the initiative through grants to relying more on support from district general funds. It is also too soon to say how new grant funds such as the CCPT, YCC, and other temporary funding streams will affect the development of enduring infrastructure to support the sustainability of Linked Learning. Early indications are that regional funding for development of work-based learning support systems and better collaboration between districts and colleges on dual enrollment will have lasting effects on the sustainability of Linked Learning. The districts

that have explicitly called out Linked Learning as a key priority in their LCAP are a step ahead of other districts in securing long-term sustainability.

Beyond explicit integration of Linked Learning in district priorities and accountability mechanisms defined by the LCAP, the institutionalization of Linked Learning within central district goals and priorities will depend in large part on the success of district efforts to fully align Linked Learning and Common Core implementation. The fact that several districts have concrete plans to support this integration in the context of developing and implementing graduate profiles that clearly convey Linked Learning and Common Core learning objectives across all grade levels is encouraging.

It is also encouraging that most districts are now adopting a go-slow approach to further pathway expansion in order to focus on deepening the quality of existing and new pathways. In the end, the quality of the student experience in Linked Learning pathways and the impacts of that experience on students' completion of high school, college and career readiness, and successful transitions to college and to work will be the most important factors determining the sustainability of Linked Learning.

Chapter 4: Pathway Quality and Fidelity

Key Findings

- Several districts set up internal systems to assess pathway quality to supplement the external pathway certification process and strengthen continuous improvement. The most successful assessment systems use results to provide targeted supports to pathways.
- Districtwide policies and guidance from technical assistance providers and industry partners help pathway teams implement integrated projects that align with Linked Learning expectations.
- In some cases, pathway projects do not meet the expectations of integration across multiple subjects, inclusion of work-based learning, and use of a common assessment but appear to still provide positive student learning opportunities.

In Chapter 3, we examined districts' plans for sustaining Linked Learning as the Foundation phases out funding for the initiative. Expansion of Linked Learning pathways helped districts ensure multiple options for students and increased the chances for long-term sustainability. However, the greater number and variety of Linked Learning pathways has focused district leaders' attention on strategies to ensure consistent quality across pathways. Most districts have now slowed expansion of new pathways and are concentrating on deepening quality in the existing ones. Districts are beginning to more systematically evaluate pathway progress on Linked Learning's Essential Elements for Pathway Quality and identify areas in which pathways require additional support. Districts are also leveraging pathway coaches to support pathway teams as they work to implement a rigorous, integrated curriculum.

In this chapter, we first discuss districtwide efforts to improve pathway quality, including the creation of systems to evaluate quality and monitor continual improvement. Next, we take a deeper look at pathway implementation of integrated projects as an indicator of the rigor of teaching and learning. Although overall pathway quality extends beyond instruction, we chose to look more closely at teaching and learning because they are central for preparing students for college and career.

Linked Learning's Essential Elements for Pathway Quality

- **Student outcomes-driven practice.** Pathway teams are focused on students' progress on "achieving measurable and consequential learning outcomes."
- **Equity, access, and achievement.** An equity-focused pathway reflects "the strength and diversity" of its community.
- **Program of study.** The program of study brings "coherence to the four core components of Linked Learning (i.e., rigorous academics, real-world technical skills, work-based learning, and personalized supports).
- **Learning and teaching.** Students engage in project-based learning that is "outcomes-focused, rigorous, relevant, and collaborative."
- **Work-based learning.** Students participate in a continuum of work-based learning to help them "master and demonstrate academic, technical, and 21st Century skills."
- **Personalized student support.** Pathway teachers tailor learning experiences according to individuals' needs and students receive support from the pathway community.
- **Pathway leadership and partnerships.** Pathway staff, school and district leaders, and partners "assure conditions are in place to establish and sustain pathway quality."

Improving Overall Pathway Quality

In 2014–15, the nine districts continued to support pathway teams as they worked to improve overall quality and successfully meet Linked Learning's Essential Elements for Pathway Quality. Many districts implemented assessment systems to evaluate quality, some using ConnectEd's OPTIC tool to gather evidence, and prioritized development of internal processes for monitoring and continuous improvement of quality. For some districts, this shift to internal continuous improvement was seen as an alternative to certification, whereas others continued to view certification as an additional means to strengthen pathway quality.

Several districts set up systems to assess quality to better understand pathways' progress with Linked Learning. The most successful assessment systems apply certification criteria for quality assessment and use the results to provide targeted supports to pathways in a continuous improvement process.

Formal quality improvement methodologies have long been common in industries such as healthcare and manufacturing, but they have only recently gained currency in educational organizations. Although methods vary, continuous quality improvement requires application of "a specific and coherent methodology" in a way that is "integrated into the daily work of individuals in the system" and is "continuous…[not] a one-off quality improvement project" (Parks, Hironaka, Carver, & Nordstrum, 2013). In 2014–15, districts acted on a need to extend quality assurance for pathways beyond certification to include a formal continuous improvement process. To begin evaluating pathway quality in a more systematic way, several districts implemented internal pathway quality assessment systems. Five districts (Antioch, Long Beach, Porterville, Sacramento, and West Contra Costa) required all pathways, regardless of certification status, to assess their quality and fidelity to the Linked Learning approach. Four of these districts (Antioch, Long Beach, Sacramento, and West Contra Costa) used the OPTIC tool to conduct assessments, while Porterville pathways began using NAF rubrics to assess quality. An additional district (Pasadena) did not require pathway assessments but used data from the OPTIC tool to provide pathways with targeted support.

Districts are using assessment tools as a means to support continuous improvement, specify areas in need of support, and identify pathways' progress with Linked Learning implementation. West Contra Costa assessed quality by developing a rubric to categorize pathways based on the quality of integrated projects and used the OPTIC tool to collect supporting documentation. The system gave the district Linked Learning leadership a clear indicator of each pathway's progress in terms of developing integrated projects. Sacramento tied district support to the use of the OPTIC tool as an incentive for continuous improvement. To receive funding or coaching support, the district required that pathways complete an action plan or self-assessment using OPTIC. In Long Beach, district leaders surveyed pathway leads about their progress with each of the seven Essential Elements for Pathway Quality at the beginning of the 2014–15 year. The district then used the results to target pathway-level supports to the two elements on which the least amount of progress had been made. Interviews with pathway leads and district staff across the districts suggested that most found the self-assessment helpful in identifying the pathway's status in the Linked Learning implementation process and reported value in having a centralized districtwide assessment system to evaluate quality. One pathway lead reflected on the value of the self-assessment:

Assessing Pathway Quality in West Contra Costa

In 2014–15, West Contra Costa set a districtwide goal for all pathways regarding integrated projects: one integrated project (per semester, per grade) that integrated two academic core content areas with the CTE course and embedded work-based learning opportunities for students. The district developed a rubric to identify pathways' progress toward meeting Linked Learning quality standards. Pathway leads used the OPTIC tool to upload evidence for their integrated projects (e.g., rubrics, student outcomes, instructions). District leaders then classified pathways as (1) not meeting expectations, (2) meeting expectations, or (3) exceeding expectations. Pathway teams met with district leaders to identify action plans for improving quality based on the assessment.

> [Conducting the self-assessment] makes you reflect on your own practice, helps to identify areas you're doing well in, areas you want to improve on. I think it kind of brought our team together, because we were all working on this together.

Despite the overall benefits of pathway self-assessment, district leaders encountered some difficulties in implementing quality assessment systems. Pathway teachers in some districts viewed the assessment as compliance driven rather than focused on improvement. For example, pathway leads in one district found that although the structure of the assessment process was beneficial, communication from the district about quality review was overly directive. Leads indicated that they would have preferred a more collaborative process as they worked to identify areas for improvement. One pathway lead in the district stated

> I think that the structure has a whole lot of aspects to it that can be really good for kids.... But I also feel like, as a teacher in an academy right now, a lot of teachers feel like we're in a punitive position all the time—you're sort of like I hope I don't get in trouble. You just want to teach your classes and make the program richer for kids, but the structure is so rigid that there's no flexibility. When your hands are tied about something, it's frustrating.

In addition, some districts encountered variation in how pathways used self-assessment tools. For example, district leaders in Sacramento found that less developed pathways used the OPTIC tool with less rigor and success. According to one Linked Learning administrator, newer pathways have a tendency to view use of the tool as compliance: "[It is] still a challenge to try to get [the new pathways] to see the [OPTIC tool's] value added as a process to self-assess and improve and not a compliance item, so I'm still struggling with a few new pathways that see it as a check-off list."

[It is] still a challenge to try to get [the new pathways] to see the [OPTIC tool's] value added as a process to self-assess and improve and not a compliance item, so I'm still struggling with a few new pathways that see it as a check-off list.

-Linked Learning administrator

Pathway leaders also encountered challenges using the OPTIC tool to upload evidence. Some pathway leaders that used the OPTIC tool found it cumbersome and time consuming. One pathway lead noted, "I have a ton of evidence that's not uploaded.... It's a huge burden to tell you the truth.... It increases the workload dramatically. Especially with ConnectEd Studios, it can take a while just to move from one page to the other." Pathway leads in Los Angeles also described the OPTIC tool as not being "user friendly." These challenges appeared to arise when pathways perceived limited support from the district or when districts failed to communicate effectively about the purpose of self-assessment. Districts may be able to overcome these challenges by improving their communication to pathway leaders on the purpose of self-assessment.

Overall, districts' experiences with implementing quality assessment systems were positive. Districts that experienced the most success emphasized that the purpose of the system was to promote quality rather than accountability. Successful districts also used the assessment results to provide targeted supports to pathway teams.

As districts increase their attention on continuous pathway quality improvement, some are seeing certification as a secondary priority, while others continue to place a high value on certification as a marker of pathway quality.

As evidenced by the quality assessment systems implemented by districts, many districts began prioritizing improved pathway quality over certification in 2014–15. For example, district leaders in West Contra Costa stated that they would rather concentrate on continuous improvement than one-time certification. As one Linked Learning administrator stated,

> One reason frankly is the name "certification"—once people think they are certified, they think that they are going to be left alone and that they have no more work to do. We want to get people on this idea of a cycle of improvement.

Other districts cited continual changes with the certification tool and negative experiences with certification in the past as reasons for emphasizing local quality assessment processes and deemphasizing certification. One Linked Learning director noted that she is hesitant to push pathways toward a process that has continually changed:

> My concern has been that there is new iteration and a third iteration. I can't put people through a process where they may not be successful. I won't. It is a huge lift to be certified and I'm not sure what the return is.

One district also halted progress toward certification because of uncertainty about who would pay for the certification process.

Despite these challenges with the certification process, some districts continued to see it as a means to ensure pathway quality. For example, the Linked Learning director in Antioch stated that in 2015–16, he hopes to prepare more pathways for certification to ensure that all pathways are high quality. He said, "On top of self-assessment, I think by spring 2016, [my goal] is pathway certification. It can be NAF or Linked Learning, but that is the overarching big goal. We use OPTIC for self-assessment right now so we know where we are." Long Beach set a goal to have 90% of its pathways certified by 2017 as it continued to hold all pathways to high standards. All routes to certification began with a self-study process (OPTIC tool or NAF) and evidence gathering, thereby forcing pathway teams to reflect on their areas in need of improvement. In Pasadena, pathways teams used self-assessment data to develop action plans that were monitored by the pathway coaches, who helped guide pathways toward certification. One pathway lead in Pasadena noted that the certification process helped clarify pathway goals for improvement: "I actually liked it because it made the entire team accountable.... So it led to great discussions. It also helped and guided us this year on what we needed to address."

> *I actually liked [the certification process] because it made the entire team accountable.... So it led to great discussions. It also helped and guided us this year on what we needed to address.*
>
> -Pathway lead

Districts that continued to see value in the certification process also cited as reasons for pushing for certification the external validation of quality that comes with it, additional support and resources from the district, and increased interest in pathways. A pathway lead in Pasadena noted that certification "validates us." In addition, an Oakland pathway lead noted that although the certification process was tedious, the benefit was greater access to resources. Similarly, a pathway lead in Sacramento cited extra support as a reason for going through certification. She stated, "We go through it for funding support. If we weren't Linked Learning certified, we wouldn't get the funding that we do. Although it is minimal, it is still very helpful." A pathway lead in Los Angeles suggested that certification had resulted in the school's receiving more positive attention from stakeholders and higher student enrollment. Moreover, pathway and district staff alike noted that certification serves as an external stamp of approval that signifies quality.

Implementing Integrated Curricula in Pathways

As discussed, district leaders have set clear policies to improve overall pathway quality. Supports from internal and external technical assistance providers also helped to ensure the rigor of pathway curriculum and integrated projects. Pathways in the nine districts continued to receive external technical assistance from ConnectEd and NAF. NAF supported pathways in developing integrated projects by providing materials, lesson plans, and example project designs. Internal supports included instructional coaches, CTE specialists, and pathway coaches.

Given the district policy and support structures in place to guide pathways, we sought to take a more in-depth look at implementation of integrated projects as an indicator of pathway quality. Although pathway quality includes all seven elements defined by Linked Learning's Essential Elements for Pathway Quality, we chose to examine pathways' teaching and learning because they are central for preparing students for college and career. To gather information on integrated projects, we spoke with leads of 23 pathways (both non-certified and certified) and asked them to share one integrated project that

represented their pathway teams' most successful project. Because we did not observe implementation of these projects, we cannot make statements about the teaching and learning associated with project implementation. In addition, any statements we make about integrated projects are limited to the sample of pathways we visited in spring 2015.

To gather information, we asked pathway leads to provide evidence of the extent to which projects met the following criteria: (1) content was integrated across subjects, (2) students participated in industry-specific authentic tasks, and (3) student learning was tied to broader school, work, or personal goals. We then evaluated the extent to which projects were integrated across at least three courses, included work-based learning, and used common assessment rubrics across subjects.

Pathway teams are following guidance from technical assistance providers and district leaders to implement integrated projects aligned with Linked Learning expectations.

The ConnectEd certification criterion for integrated projects (i.e., integration of at least one technical and two core academic subjects) may have helped pathways develop projects that were better integrated across multiple subjects. In our review of pathway projects, we found that 15 of the 17 certified pathways we visited implemented projects that were integrated across at least one technical and two core academic subjects. Relatedly, the 2014–15 student outcomes data presented in Chapter 6 suggest that students in certified pathways are more likely to stay in school and accumulate credits than students in non-certified pathways. The high degree of project integration among certified pathways is one indicator of quality that may help explain this finding.

Across all pathways (both certified and non-certified), the extent to which projects were integrated across subjects also appeared to be associated with district guidelines for the optimal number of subjects to integrate and the supports pathway teams received. Long Beach, Pasadena, and West Contra Costa have clear district guidelines on integrated projects; six of the seven pathways in these districts (for which we reviewed integrated projects) implemented projects that were integrated across at least three subjects. For example, West Contra Costa asked all pathways to create two integrated projects per grade across one technical and two core academic courses. Los Angeles and Oakland have a strong team of external technical assistance providers supporting pathway teams with curriculum and instruction, and five of the six pathways we visited across both districts were implementing projects that integrated three subjects. Similarly, pathway project examples from Porterville had strong integration across four subjects and benefited from the support they receive from NAF, which provides pathways with already developed course curriculum, projects, and assessment rubrics. Pathway teams with this level of guidance were better prepared to implement meaningful integration across subjects. The remaining districts (Montebello and Sacramento) did not have the same structured guidelines or supports specifically focused on implementing integrated projects, and no pathway projects met the benchmark of integrating across one technical and two core academic subjects. In these two districts, some pathways integrated projects across two courses and others implemented projects in only one subject. One district coach emphasized the need for pathway coaching to ensure pathway quality, noting that pathway coaching, whether external or internal, was critical for quality of instruction and teacher knowledge and capacity to grow and learn.

Internal Coaching

As the Foundation phases out funding, districts are increasingly turning to internal coaching to support pathways. Their experiences suggest that internal coaching is most effective when the coaches are fully released from other district and pathway responsibilities and have previously led pathways. When internal coaches were not fully released, they struggled to have the time necessary to adequately support pathways. In addition, internal coaches who were former pathway leads had the advantage of credibility and authority for their work with the pathway leads they supported.

Inclusion of work-based learning in integrated projects appears to be more prominent in pathways with strong work-based learning support from advisory boards and industry experts.

Half the sampled pathway projects included work-based learning. Most commonly, this consisted of students receiving feedback from industry partners on a component of the project or speaking with an industry partner who does work related to the project content. Within each district, the number of pathways that included work-based learning in the integrated project varied. In most districts, only one or two of the pathways included work-based learning. The only district in which all visited pathways did so was Porterville. Porterville has strong district-level work-based learning supports that include two district-level work-based learning coordinators and guidelines requiring that all students in Linked Learning have three core work-based learning experiences before graduation. Because of this strong work-based learning culture, the Porterville pathway teams sought assistance from their advisory boards as well as local industry experts to develop and implement their pathway projects. For example, the Environmental Science Academy lead invited a local landscape designer with expertise in native plants to give students feedback on their plot designs for a native plant landscaping project. The lead of the Law, Justice, and Education pathway sought feedback from a local police officer on a Murder in the Park project, which included police report writing activities in English classes. This level of external support from advisory boards or professionals for identifying and integrating work-based learning may be necessary for all pathways to develop projects with a meaningful work-based learning component.

Most pathway projects had defined student learning goals, but few used common assessments across subjects to evaluate students' performance. Half the pathway teams that did use common assessments had received technical assistance to develop rubrics.

When asked about the types of student learning pathway teachers hoped to build through integrated projects, most teachers cited 21st century skills such as communication, professionalism, leadership, and critical thinking. In addition, some pathways also sought to build students' technical skills through integrated project participation. In four districts (Antioch, Long Beach, Los Angeles, and Sacramento) pathways were making efforts to align project outcomes with the districts' graduate profiles.

To measure student learning, teachers in most pathways used subject-specific rubrics in the integrated project rather than a common assessment rubric; in fact, most pathway leads did not know how their colleagues in other subjects were assessing the integrated project. However, six pathway teams have designed and implemented common rubrics used by all subject teachers participating in the integrated projects. Three of the six pathways with common rubrics participated in ConnectEd's Advanced Pathway Performance Assessment System (APPA) during the 2012–13 and 2013–14 school years. Through participation in APPA, these pathways received support for "implementing pathway-wide systems of authentic performance-based assessment that include the use of common, outcomes-aligned rubrics and performance tasks" (ConnectEd, 2014b). These pathways received technical assistance for developing common assessment rubrics, which suggests that structured support for specific curriculum and instruction goals could help pathways better meet those goals.

In some cases, pathway projects did not meet the expectations of integration across multiple subjects, inclusion of a work-based learning, and use of a common assessment but appeared to still provide positive student learning opportunities.

The analysis of integrated projects revealed wide variation in the number of courses integrated, inclusion of work-based learning experiences, and use of common assessment rubrics. Only 7 of the 23 projects reviewed included all three characteristics. Yet some projects that did not meet all three criteria appeared to offer students meaningful learning opportunities. For example,

- Life Academy in Oakland implemented an integrated project that included three courses and a common assessment rubric but fell short of including a work-based learning component. In humanities, students looked at the role the United States has played in wars. Students were split into two groups—war hawks and doves—to debate each side. In chemistry, students learned about the chemical weapons of war and the evolution of chemical warfare; and in physiology, students learned about the health effects of war, from post-traumatic stress disorder to birth defects from Agent Orange. As a culminating project, students participated in a Socratic seminar

during which they had to defend their position and validate the use of chemical weapons. Despite not including work-based learning, this project offered students opportunities to connect content across subjects and engage in thinking critically about the effects of war. A staff member at Life Academy praised the project for engaging students: "It's really, really interesting and engaging to get kids to work with curriculum and to look very critically at our history, which I think is a cool opportunity."

- The Information Technology Academy's CTE teacher in West Contra Costa implemented a project with a strong work-based learning component but no integration across courses. Students worked in groups of four or five on a client-based project, which culminated in developing a website for the client. The project integrated technical learning with project management skills. Students delivered a training manual on using the site in addition to building the website as their final product. Students were required to collaborate with each other on this project, communicate directly with the client, and use the technical skills they had gained to build the site. The students were assessed using a rubric for each objective area. In addition, the client provided feedback that informed the overall assessment. Even though this project was not integrated across subjects, students were meaningfully engaged in applying their technical knowledge, working collaboratively, and responding to client needs. In addition, they received real-time feedback from their client, getting a glimpse into what it would be like to be employed at a client-based firm. A staff member shared that the project provided a unique opportunity to apply skills in a real-world setting:

  > One of the benefits is that it takes their work outside the classroom and makes it more real for them. [Students] get a chance to apply online design.... When they're actually working on a real live server, they have to have much more skills for that. It's a lot more uploading, downloading, editing a live document.... We'll get a lot of feedback from the advisory board about the professionalism of the students and the strengths they're seeing in terms of intellectual curiosity and ability to solve problems.

These project examples do not meet the expectations for a strong integrated project as defined by ConnectEd's certification criteria. They are tied to strong learning outcomes, however, and offered students the opportunity to work collaboratively and engage in learning that requires critical thinking and real-world experiences.

Some pathway leads said that there are legitimate roadblocks to meeting the ConnectEd certification requirements and district policies for integrated projects. For example, some pathway teachers reported that including certain subjects such as math in integrated projects can be difficult because pathway students enroll in math classes outside their pathways and the math teachers face pressures for meeting district curricular requirements. In a specific example, math teachers in Pasadena did not participate in integrated projects during the 2014–15 school year because they were expected to implement a new Common Core standards-aligned curriculum, which did not leave time to depart from the curriculum. In addition, finding appropriate and timely work-based learning opportunities is difficult. Pathway leads have limited time and capacity for securing appropriate industry partners that can provide work-based learning opportunities that connect with integrated projects in a meaningful way. Pathway leads who have been successful often use their personal time to build relationships with industry partners. For example, one health pathway lead has been successful in partnering with hospitals located in or near her district, but she spends a significant amount of her personal time fostering those relationships.

Given these capacity constraints, the work-based learning that pathway leads were able to incorporate into projects was frequently superficial or tenuously related to the project. The majority of work-based learning opportunities were 1-day job shadows or guest speakers. As a result, there may be tension between having coherent, high-quality projects that integrate across technical and academic courses and incorporate work-based learning experiences and creating a logical project with clear learning goals. In some cases, pathways may be fulfilling the requirements of an integrated project at the expense of a logical project.

Implications

Several districts have set up policies and systems to assess pathway quality and determine each pathway's progress with Linked Learning implementation. Districts that continued to emphasize certification also used the process as a means for assessing pathways and identifying areas for improvement, as well as external validation. This emphasis on the quality of *all* pathways suggests that districts are as much concerned with developing a high-quality system of pathways as they are with accumulating certification recognition for a small number of high-performing pathways. Formal internal continuous improvement processes and external certification are complementary approaches to pathway quality assurance. In addition, our review of a sample of integrated projects revealed that certification status, district requirements for integration, and support from technical assistance providers are all associated with the extent to which pathway projects integrate curriculum across subjects, providing strong evidence that pathway teams seek to comply with district policies and requirements and follow guidance from technical assistance providers. In particular, the association between supports for work-based learning inclusion and use of common assessments and the presence of these components in projects suggests that structured supports for specific curriculum and instruction goals could help pathways better meet those goals. As some districts continue to expand the number of pathways and the Foundation moves to a regional support strategy, attention to pathway quality assurance and providing pathways with targeted support in a continuous quality improvement process will be important for maintaining a high-quality system of pathways.

In addition, because district policies and supports appear to have a strong influence on pathway teams' implementation of Linked Learning, district leaders and the Foundation may want to think strategically about how quality criteria are interpreted and applied to pathways. For example, certified pathways are expected to implement projects that include one technical and two academic subjects. However, the Information Technology Academy in West Contra Costa, a non-certified pathway, has developed a strong integrated project that did not meet this requirement but still appeared to offer students a meaningful learning opportunity. Therefore, it may be important for district leaders to explore which requirements (e.g., clear learning outcomes, structured assessments, inclusion of work-based learning) are essential for student learning.

As demonstrated in this chapter, district policies and practices appear to have a substantial influence on Linked Learning implementation. In Chapter 5, we explore how district policies regarding pathway choice and enrollment influence the profile of students entering and staying in pathways.

Chapter 5: Pathway Access and Equity

Key Findings

- District policies aimed at open access to pathways and informed choice are a first step toward ensuring equitable enrollment, but student preferences play a key role in determining enrollment patterns.
- Some districts are offering wider pathway choice and more centralized recruitment in an effort to improve pathway access for all students.
- Across the initiative as a whole, student persistence in certified pathways was higher than in non-certified pathways.
- Overall student persistence in certified pathways was high, but students with low prior achievement, English learners, and special education students left pathways at above-average rates. In part, these trends for student subgroups were due to scheduling challenges and because it can be difficult for small pathways to meet the needs of students in these subgroups.

In the preceding chapters, we described districts' efforts to ensure pathway quality as they expand and sustain Linked Learning. In this chapter, we delve into equity in pathway access, enrollment, and persistence, one of ConnectEd's Essential Elements for Pathway Quality. According to ConnectEd, a pathway is equitable when it "serves well any interested student, regardless of race, ethnicity, gender, sexual orientation, socioeconomic status, special needs, or prior academic achievement…[and] intentionally reflects the diversity and strengths of its school, community, and district," (ConnectEd, n.d.). Fully realizing this vision of student equity involves three components: equitable access to pathways, representative enrollment in pathways, and student persistence in pathways as evidence that pathways serve all students well.

In this chapter, we present evidence of these three components of pathway equity. We begin by examining the district policies and practices that determine students' access to pathway as an indicator of equitable access. We classified the district choice policies and recruitment practices using a framework based on portions of ConnectEd's guidelines for student equity, access, and choice (ConnectED, 2014a) to see whether districts have implemented policies and practices to ensure equitable access to pathways. We then examine the degree to which pathways mirror the high school population in each district as an indicator of representativeness, the second component of equitable pathways. Policies that encourage open access to pathways are a prerequisite to representative enrollment, but many other factors come into play as well in an enrollment system based on student choice. Research on small learning communities and charter schools suggests that choice-based reforms, if executed poorly, can exacerbate educational inequality by stratifying students by race, class, or prior academic achievement within schools (in the

Linked Learning Guidelines for Equity, Access, and Choice

- Establish policies to make pathways accessible to all student populations (i.e., English language learners, special education students).
- Develop and implement "outreach strategies emphasizing the potential value that pathways have for every student" and have a clear set of strategies "for marketing all pathway options to middle school students."
- Create opportunities for students to "'experience' a pathway during the summer, an intersession, or through a middle school pre-pathway program."
- Implement "equitable, randomized procedures to ensure that most, if not all, students can enroll in their first or second choice of pathways."
- Allow students to "change pathways at least once if they discover their initial selection is not a good match."

Source: ConnectEd (2014a)

case of small learning communities) (Lee & Ready, 2007a) or among schools (in the case of charter schools) (Booker, Zimmer, & Buddin, 2005; Clotfelter, Ladd, & Vigdor, 2013; Frankenberg, Siegel-Hawley, & Wang, 2011). Factors such as proximity, availability of transportation, family tradition, and academic reputation may be just as important in determining student preferences for a career theme but may be difficult for districts to influence. We consider these two components of pathway equity—access and representation—together to explore whether policies aimed at ensuring open access to pathways result in equitable enrollment patterns. Finally, we examine persistence in pathways as an indicator of how well pathways are adequately serving all students.

For this analysis, we drew on both interviews with district and pathway teams and descriptive statistics on pathway enrollment and persistence. We present descriptive statistics overall as well as for three subgroups of students who typically need specialized supports—special education students, English learners, and students with low prior achievement—for both certified and non-certified pathways.[15] Non-certified pathways include any career-themed program that is flagged by a district as a pathway but has not been certified as a Linked Learning pathway. Interviews with district staff indicated that pathways in this category cover a wide range of adherence to the Linked Learning approach, with some themed in name only and others nearing certification. In this chapter and the next, we summarize student-level data for the classes of 2013–15 from the nine Linked Learning districts.[16] To ensure that the data were aligned across sources, we classified districts according to the choice and recruitment policies they had in place when these students enrolled in high school and note any more recent changes to these polices.

Implementation of Choice Policies and Recruitment Practices

In this year's evaluation, we analyzed student enrollment data within a framework of choice and recruitment strategies (see Exhibit 5-1). This framework situates the districts in terms of their implementation of policies and practices that ensure open access to pathways.

Two districts used districtwide choice where all students applied to pathways, implementing a policy that is more aligned with the goal of equitable access to pathways.

The nine districts either offered students districtwide choice (students could access any pathway option in the district) or limited choice (students could access only pathways in a specific region or school or faced selection requirements such as minimum GPA). Districts that offered districtwide choice approached it in two ways: (1) all eighth-graders were required to apply to a pathway and/or high school to attend in ninth grade or (2) only eighth-graders interested in attending a pathway in ninth grade were required to apply to a

Exhibit 5-1
District Choice Policies and Recruitment Practices

	Districtwide Choice		Limited Choice
	All Apply	Interested Apply	
District-driven Recruitment	Pasadena	Antioch Porterville Montebello Sacramento	Long Beach
Pathway-driven Recruitment	Oakland		Los Angeles West Contra Costa

Note: Although some districts have recently made changes to their choice policies or recruitment practices, this categorization reflects the policies in place when students in the 2013–15 cohorts entered a pathway.

[15] We define students with low prior achievement as those who scored below basic or far below basic on the English Language Arts California Standards Test (ELA/CST) from the most recent year available before pathway start. This definition is aligned with the definition of low prior achievement in Chapter 6 but differs from that used in the Access & Equity chapter of the fifth-year report (Guha et al., 2014), which also included students scoring at the basic level on the ELA CST.

[16] The cohorts and pathway certification status match those presented in the fifth-year report (Guha et al., 2014).

pathway.[17] A policy that requires students to make a choice means that students cannot default to the closest high school or the one they are assigned to by catchment area. These choice policies are the key determinant of open access to pathways.

Recruitment efforts are also key to understanding students' pathway enrollment patterns. Recruitment efforts can determine access to pathways because without an active recruitment effort students may be unaware of pathway options and ill informed about career options. In addition, recruitment efforts may help shape students' preferences, encouraging them to break out of an expected career path or neighborhood school option by exposing them to new opportunities. Some of the districts drove the recruitment efforts centrally. In these districts, pathways were generally involved to some degree in the district-driven recruitment efforts, but most marketing and recruitment efforts were centralized at the district level. Other districts provided some information about pathway options in high school choice materials but allowed individual pathways to drive a majority of the middle school recruitment and marketing efforts. This generally resulted in uneven recruitment efforts across pathways, with some pathways conducting direct outreach to middle schools and others taking a more passive approach to recruitment. The difference between a district-driven and pathway-driven recruitment effort is perhaps best exemplified by the fact that district-driven recruitment always includes some type of centralized recruitment fair in which eighth-graders and their parents receive information about all pathway options. In pathway-driven recruitment, students and parents are more likely to learn about pathways one at a time.

District policies aimed at open access to pathways and informed choice are a first step toward ensuring equitable enrollment, but student preferences play a key role in determining enrollment patterns.

As an indication of how accessible pathways are to all students, we considered district choice policies and recruitment practices in combination with pathway enrollment data to identify how choice and recruitment are associated with the profile of students entering certified and non-certified pathways (Exhibit 5-2). This examination of the degree to which certified pathways reflect the diversity of the high school student body in each district revealed that equitable enrollment in pathways is difficult to achieve. Only in two districts, Pasadena and Sacramento, did certified pathways enroll English learners, special education students, and students with low prior achievement at representative rates. Although both of these districts allowed students to choose pathways across the district and had district-driven recruitment practices, the relationship between the typology of policies and practices in Exhibit 5-1 and the enrollment patterns in Exhibit 5-2 were by no means clear in the nine districts. In part, this reflects the tension between inclusiveness and choice. The challenge in realizing equitable representation in a choice-based system stems from the myriad of factors that determine students' enrollment choices, many of which reinforce stratification by race, class, and achievement level.

Choice policies and recruitment practices aimed at equitable access are a first step to ensuring equitable pathways, but student preferences also are important in enrollment patterns and may be hard for districts to influence. For example, research indicates that low-income and minority students generally choose their neighborhood school because of convenience, tradition, a desire to be with other students with similar backgrounds, and lack of transportation to other district public schools (Makris, 2015; Nathanson, Corcoran, & Baker-Smith, 2013; Saparito & Lareau, 1999; Weiher & Tedin, 2002), suggesting that school enrollment based on student choice will reflect patterns of residential segregation. Students also self-segregate by pathway career theme and academic reputation. For example, the fifth-year evaluation report presented evidence that students sort by gender: Engineering pathways across the initiative enrolled disproportionately high numbers of boys, whereas health pathways enrolled disproportionately high numbers of girls. In addition, pathway reputation can serve as a deterrent to enrollment, either because the pathway is viewed as a vocational track (in the case of a transportation pathway) or because a reputation for being academically demanding attracts high-achieving students (Guha et al., 2014). In

[17] For all districts, including those with pathways beginning in 10th grade (Oakland and West Contra Cost and some pathways in Pasadena), we examined district enrollment policies for entering high school in ninth grade. Therefore, this categorization does not include choice policies or recruitment practices used by high schools to enroll students in pathways in 10th grade.

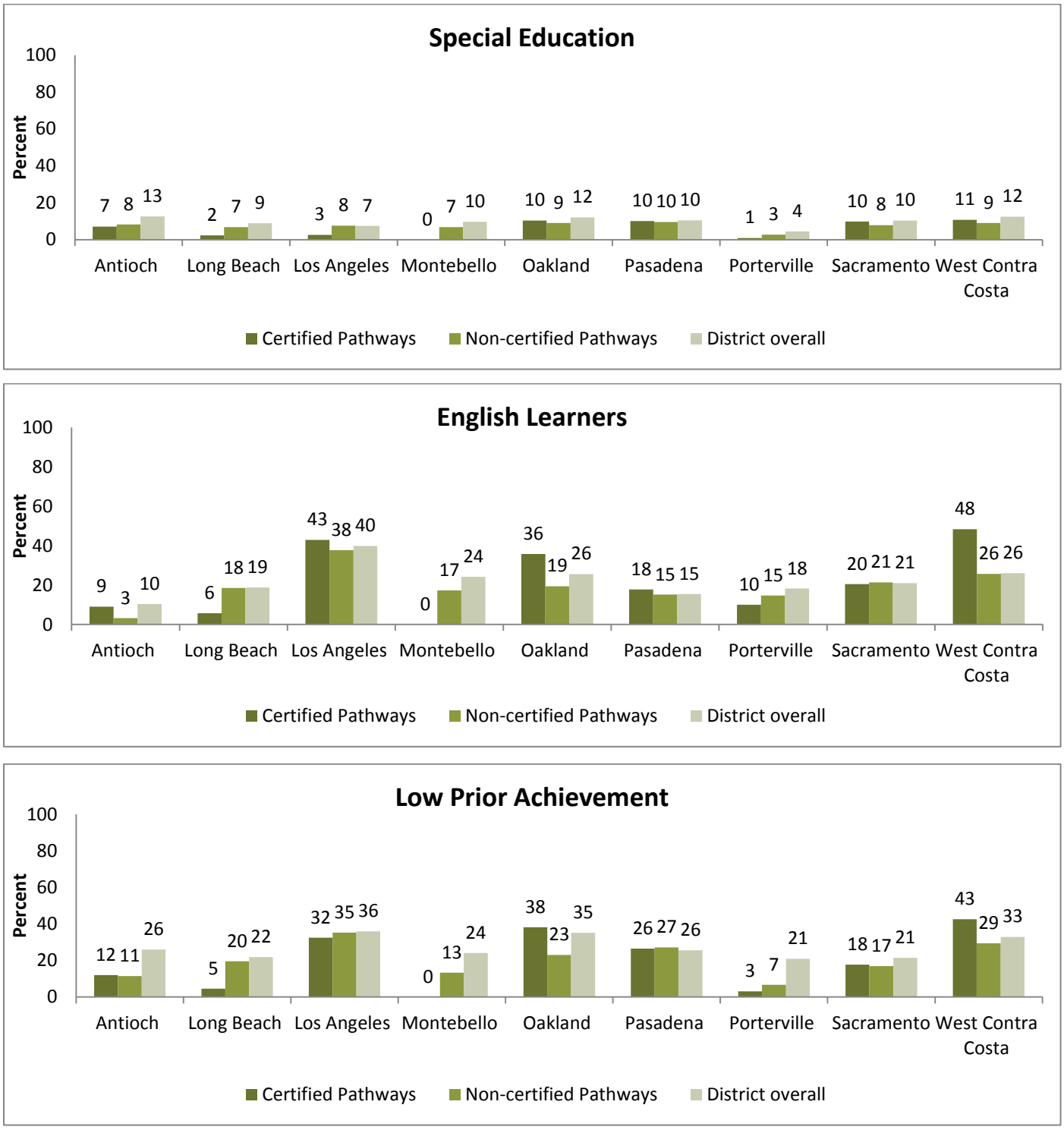
considering the relationship between districts' choice policies and recruitment practices and their pathway enrollment patterns, these student preferences are key, limiting our inferences regarding these findings.

Districtwide Choice and District-driven Recruitment

Antioch, Montebello, and Porterville had district-driven recruitment practices to inform students of pathway options and allow pathway choice across the district. These districts did not, however, actively require students to select a high school option. These districts therefore provided the opportunity for students to make an informed choice about their high school but stopped short of requiring them to choose. In these districts, we see mixed patterns of subgroup enrollment in pathways. In Antioch, Montebello, and Porterville, pathways enrolled lower proportions of underachieving and special education students. Enrollment of English learners across certified and non-certified pathways in these three districts was not consistent. For example, Porterville enrolled lower proportions of English learners in certified pathways and comparable proportions in non-certified pathways relative to the district average; in Antioch the opposite was true.

Counter to this mixed enrollment pattern, in Pasadena and Sacramento subgroup enrollment in certified and non-certified pathways reflected the district as a whole. Enrollment in Pasadena and Sacramento provides promising evidence that district-driven recruitment practices coupled with districtwide choice policies could help to make pathways more accessible and open to all students. Although Pasadena and Sacramento approached districtwide choice differently (i.e., all apply or only interested apply), their implementation of districtwide recruitment strategies may have consistently informed all students about their pathway options, contributing to pathways enrolling students with characteristics reflective of the district. Another feasible explanation is that pathways in both Pasadena and Sacramento reflected district demographics because pathways were generally located in lower performing schools with large populations of special education students, English learners, and students with low prior achievement.

Exhibit 5-2
Student Subgroup Enrollment in Pathways



Source: District-provided student data.

Note: Montebello does not have any certified Linked Learning pathways.

Limited Choice and District-driven Recruitment

In Long Beach students chose pathways, within some constraints. Students could apply to any pathway within a regional boundary. Long Beach also provided a small number of districtwide choice pathways, but these require students to meet entrance requirements (e.g., minimum grade point average or demonstrated interest in the pathway theme). Given that nearly all Long Beach high school students enrolled in a pathway, we would expect that pathways would enroll a representative portion of each subgroup of interest. Enrollment data in Long Beach showed that non-certified pathway enrollment reflected district averages for special education students, English learners, and students with low prior achievement. Certified pathways fell short of enrolling representative proportions of these subgroups, however. Four out of five certified pathways in Long Beach had entrance requirements, suggesting that enrollment criteria counter efforts to make all pathways open and accessible.

Districtwide Choice and Pathway-driven Recruitment

Like Pasadena, Oakland has a districtwide choice policy in which all eighth-graders applied to a pathway or high school option. However, Oakland differed from Pasadena in that it used pathway-driven recruitment strategies to communicate pathway options to students. In Oakland, we see mixed enrollment patterns of English learners, special education students, and students with low prior achievement in certified and non-certified pathways. Non-certified pathways in Oakland enrolled lower proportions of students in these subgroups than the district average, and certified pathways enrolled higher proportions of English learners and similar proportions of special education students and underachieving students. The lack of a consistent pattern in enrollment suggests that pathway-driven recruitment strategies may result in uneven representation of subgroups in pathways. Another possible reason is the timing of the choice and enrollment process. Students in Oakland entered most pathways in 10th grade but were required to choose a high school in eighth grade. Because students were required to make a high school choice in eighth grade and a pathway choice in ninth grade, they may not have been thinking about pathway options when they selected a high school. Finally, student preferences for neighborhood schools may mean that pathway enrollment patterns are more reflective of the school and community in which the pathway is situated than the district overall.

Limited Choice and Pathway-driven Recruitment

Los Angeles and West Contra Costa provided limited choice to students and allowed individual pathways to drive student recruitment. In Los Angeles, eighth-graders could choose to enroll through the Zones of Choice program, meaning they could select from a set of schools and pathways in a geographically defined zone. In West Contra Costa, students could choose pathways in their neighborhood high school. Non-certified pathways in Los Angeles enrolled comparable proportions of English learners, special education students, and students with low prior achievement. In West Contra Costa, non-certified pathways enrolled comparable proportions of English learners and slightly lower than district averages of special education students and students with low prior achievement. Certified pathways in Los Angeles enrolled similar proportions of English learners and slightly lower proportions of special education students and students with low prior achievement than the district average for these subgroups. In West Contra Costa, certified pathways enrolled proportions of special education students comparable to the district and larger proportions of English learners and students with low prior achievement. Because both West Contra Costa and Los Angeles offered students limited choice, pathways most likely represented the demographics of the neighborhoods they are located in, which may not be representative of the demographics of the district.

Some districts are offering wider pathway choice and more centralized recruitment in an effort to improve pathway access for all students.

District choice policies regarding pathway enrollment have not changed much over the course of the initiative, but some districts have made adjustments for a wider choice of pathway options. Long Beach has extended districtwide choice to all pathways. Antioch requires all eighth-graders to select a high school or pathway option for ninth grade. Both these shifts show movement toward a more consistent district-level process for students to select a high school or pathway. These positive steps can help ensure all students are informed of their pathway options and can access and enroll in the pathway of their choice.

Leaders in some districts with districtwide choice have also revised recruitment practices to better communicate the pathway options to students. Some have started to provide more systematic districtwide recruiting events and materials, such as recruitment fairs, information fairs, and centralized marketing materials, which enable all pathways to present their program of study in a comparable format. For example, Porterville has improved access to information by advertising pathways by career theme and deemphasizing the pathway location. All districts with district-driven recruitment strategies have been holding recruitment fairs for eighth-graders and their parents to learn about their pathway options. For example, Montebello bused all eighth-graders to East Los Angeles College where they attended a fair to learn about their pathway options. Long Beach district leaders centralized information about pathway options in an online choice system. Through this centralized system, the district hopes to facilitate greater equity and transparency in the high school and pathway choice process.

Although these efforts to centralize recruitment are positive, conveying enough about pathways to enable students to make a well-informed choice is challenging. For example, district leaders in Antioch developed more centralized recruitment strategies so students learn about all pathway options at once. Leads of one pathway were disappointed, however, explaining that the district-driven outreach was not adequately conveying the unique culture or demands of each pathway. Long Beach district leaders hosted recruitment fairs in multiple locations throughout the district to create consistency in communication and make the events geographically accessible to all students and parents. However, the quality of pathway presentations at these events still varied. One pathway lead observed that students were visiting pathway booths with the most attractive displays rather than those with career themes of interest.

As district leaders seek to improve communication about pathway options, exposing students to career themes in elementary and middle school could help them make better pathway choices.

In seeking ways to improve communication about pathway options, some districts have begun more substantive middle school outreach beginning in the earlier grades. These efforts are intended to help students to see and experience a clear connection between middle school, pathways, and careers through counseling resources, industry-specific summer bridge programs, and college and career readiness curriculum. To facilitate career exploration, two middle schools in West Contra Costa have created pathways mirroring those available in the neighborhood high schools. To further their middle school outreach efforts, some districts have been turning to CCPT funds. This year, Long Beach used CCPT funds to incorporate middle school outreach efforts into its districtwide choice strategy. Pasadena and Porterville plan to use the second round of CCPT grants to support the alignment of middle school programs with certified pathways. One Linked Learning director highlighted the benefit of reaching out to students while they are still in middle school:

> If we get a kid in the fifth-sixth grade and they find out they really like this stuff because it's hands on and really exciting, I believe that will go a long way to helping them overcome their math and science barriers. So that when they get into high school they are prepared.

Even students making a well-informed choice of career theme, uninhibited by restrictions on choice, will remain only in pathways that meet their needs. We next examine the extent to which students remain in both certified and non-certified pathways.

Student Persistence in Pathways

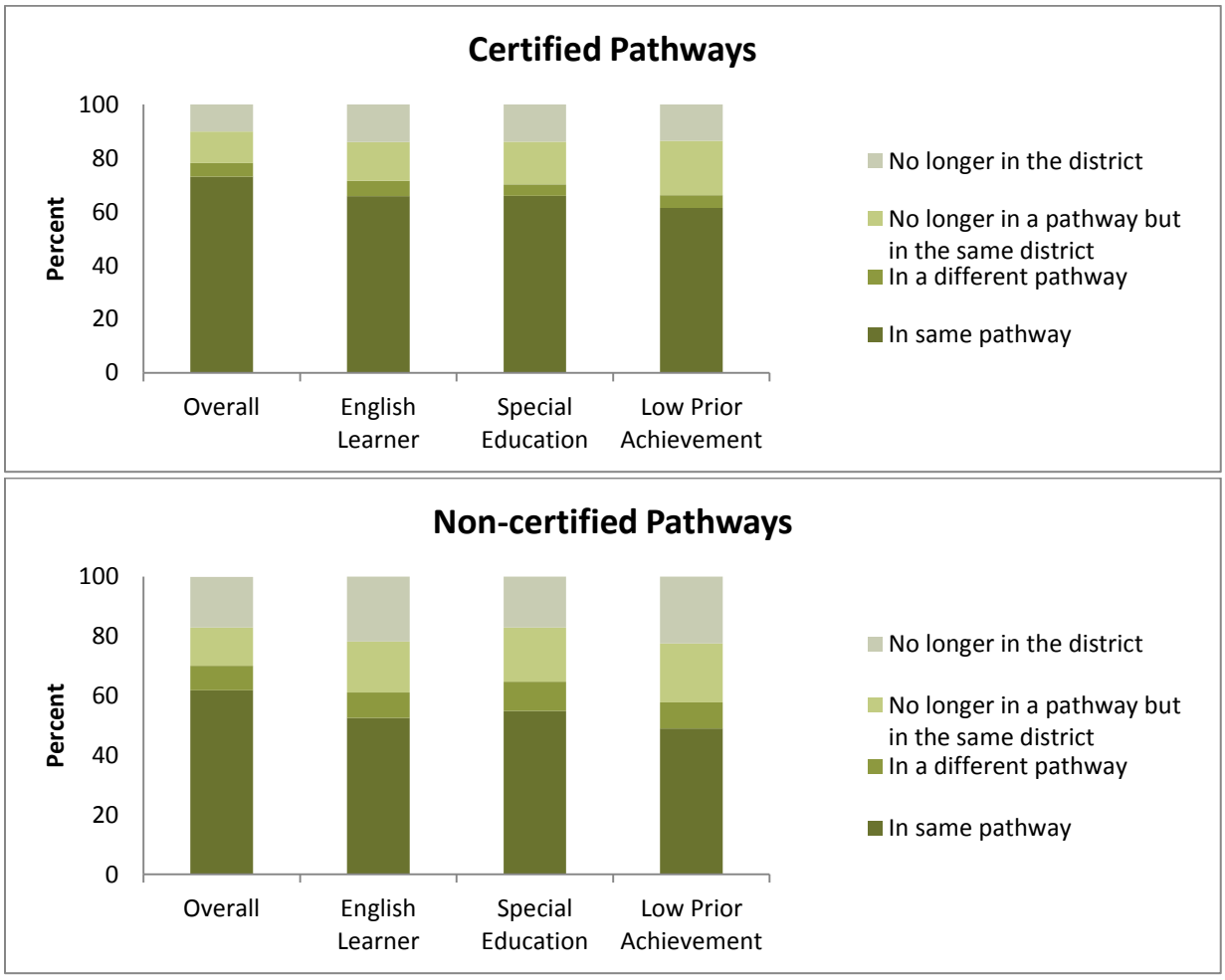
An equitable pathway "reflects the diversity and strengths of its school, community, and district" by engaging and supporting students not only in the initial year of the pathway, but throughout the high school years (ConnectEd, n.d.). As an indicator of how well pathways are serving students, we examined pathway persistence, specifically, how many students in the classes of 2013–2015 remained in their original pathway through the beginning of 11th grade. In addition, just as we looked at pathway enrollment rates by English learners, special education students, and students with low prior achievement as an indication of equity of access, we examined pathway persistence by the same subgroups as a proxy for how well pathways served their needs. In this analysis, we present the percentages of students who remained in their initial certified or non-certified pathway, those who moved to a new pathway, and those who stayed within the district but left their pathway. This analysis builds on the fifth-year report by including the class of 2015 and reporting on student persistence in non-certified pathways as well as certified pathways. In addition to illuminating how student persistence varies between certified and non-certified pathways, this analysis also provides context for Chapter 6, which presents outcomes for students by pathway type (certified, non-certified, traditional high school) based on their original pathway enrollment.

Overall student persistence in certified pathways was high, but students with low prior achievement, Engish learners, and special education students left pathways at above-average rates. In part, these trends for student subgroups were due to scheduling challenges and because it can be difficult for small pathways to meet the needs of students in these subgroups.

More than 70% of students who started out in a certified pathway in its lowest grade level were still enrolled in the pathway by the time they reached 11th grade, but students with low prior achievement, English learners, and special education students had lower than average rates of persistence (Exhibit 5-3). Possible explanations for student subgroups' lower persistence include challenges with scheduling and academic supports. Scheduling was a barrier to full pathway inclusion because students with special needs must enroll in certain classes that often interfere with the pathway program. In Pasadena, Porterville, and Sacramento, student persistence in certified pathways was 61%, 63%, and 50%, respectively, lower by over 10 percentage points than certified pathways in the other districts. Persistence for special education students and students with low prior achievement in these three districts was even lower. In Sacramento, four of the five certified pathways are stand-alone schools that may not have offered courses (e.g., credit recovery or English language development courses) required for students in these subgroups to graduate. Therefore, students who required credit recovery or other special programs were obliged to attend a high school that offered those courses. Although Pasadena's overall student persistence in certified pathways and non-certified pathways was relatively low (61% and 50%, respectively), special education students in non-certified pathways persisted at higher rates. A possible explanation may be scheduling changes at one comprehensive high school that offered an eight-period day, which enabled special education students to receive their required supports while also accessing pathway programs.

During the 2014–15 school year, pathway teams shared promising practices intended to support students' academic progress. For example, Oakland plans to use CCPT and Atlantic funds to expand students' access to targeted academic services. Pathway teachers in both Oakland and West Contra Costa described processes by which pathway teachers identified supports, services, and interventions for struggling students. As in previous years, these support services were pathway specific and appeared to be provided ad hoc by pathway teams. To help ensure student persistence, districts may need a systemic approach, including informing students of pathway expectations at the time of enrollment and providing adequate support once they enter the pathway to facilitate positive secondary and postsecondary outcomes for all students.

Exhibit 5-3
Persistence to the 11th Grade Overall and by Subgroup



Source: District-provided student data.

Across the initiative as a whole, student persistence in certified pathways was higher than in non-certified pathways.

Students were more likely to remain in a certified pathway than a non-certified pathway through the beginning of 11th grade, and this trend was consistent across subgroups (i.e., English learners, special education students, students with low prior achievement) (Exhibit 5-3). At the district level, students' persistence in their original pathway was higher in certified pathways than in non-certified pathways in all but one of the eight districts that have certified pathways.[18] Differences in student persistence between certified and non-certified pathways ranged from 8 percentage points in West Contra Costa to 23 percentage points in Los Angeles. Higher persistence in certified pathways—both overall and within each subgroup—suggests that certified pathways may be more successful than non-certified pathways in meeting student needs once they enter a pathway.

As mentioned, non-certified pathways represent a significant range of adherence to the Linked Learning approach. It would be reasonable to assume that students feel more connection to pathways that have fully implemented the Linked Learning approach. In Chapter 4, we reported that certified pathways were more likely to integrate across multiple subjects and have clearly stated student learning outcomes. Pathway teams' intentionality in planning curriculum could provide students with a more relevant, engaging approach to learning, encouraging them to remain with their pathway throughout high school. In addition, to become certified, pathways must meet certification requirements, including personalized learning supports that "tailor learning experiences to students' individual developmental needs, skills, strengths, interests, and aspirations" (ConnectEd, n.d.). Although certified pathways struggle to meet the level of supports expected by ConnectEd, relative to non-certified pathways they most likely provide more of the academic and social supports students need to succeed and persist in pathways.[19]

Implications

In this chapter we examined how district choice policies and recruitment strategies are associated with the profile of students who enroll in and stay in pathways, as an indication of how well pathways are attracting and retaining a student body that reflects the overall district demographics. The analysis revealed that pathways in two districts (Pasadena and Sacramento) with districtwide choice and district-driven recruitment enrolled a student body that is approximately representative of the district profile, suggesting that more centralized, systematic choice and recruitment strategies may help to equitably attract all students. In the other districts that used districtwide choice and district-driven recruitment practices (Antioch, Montebello, and Porterville), subgroup enrollment did not reflect district demographics, indicating that the implementation of policies and practices may equally influence the accessibility of pathways to all students. Therefore, as the initiative continues to expand, district leaders may want to explore not only how they can create equitable choice policies and recruitment practices to make pathways open to all students, but also how to substantively engage students in career exploration so all students have access to pathway career themes of interest. New districts and regions intending to implement Linked Learning should be aware that fostering equitable access and representative enrollment in a system of pathways requires intentionality. Choice-based education reforms have the potential to increase stratification by race, class, and prior achievement, particularly in already residentially segregated school districts. To counterbalance these stratifying forces districts must adopt an active equity agenda to ensure that pathways serve all students.

[18] Montebello does not have any certified pathways. Because the persistence trends within district mirror those of the initiative as a whole in all districts but one, we have not broken out these graphs by district as we did for enrollment. We provide persistence rates by district in the appendix.

[19] These descriptive statistics do not adjust for differences among students' backgrounds. Differential trends in persistence between certified and non-certified pathways are approximately equal between all subgroups of interest, so we do not worry that differences in enrollment patterns between students of different observable characteristics drive these findings. However, it is possible that students who enroll in certified pathways differ on unobservable characteristics (e.g., motivation) that could influence these results.

We also found that student persistence appears to be correlated with pathway certification status. Certification requires that pathways meet certain programmatic standards. The relationship between certification and student persistence suggests that quality assessments such as certification could help pathways build programs that adequately support the needs of all students. As presented in Chapter 4, districts are making efforts to evaluate pathway quality, which could be a promising step for ensuring students are supported and thus stay in pathways. In addition, once students entered pathways, the supports they received depended on services offered in each individual pathway. As districts continue to expand a system of Linked Learning pathways, they should consider how to better provide all students with necessary supports to succeed, regardless of the pathway they are enrolled in.

Chapter 6: College-Ready High School Graduates

Key Findings

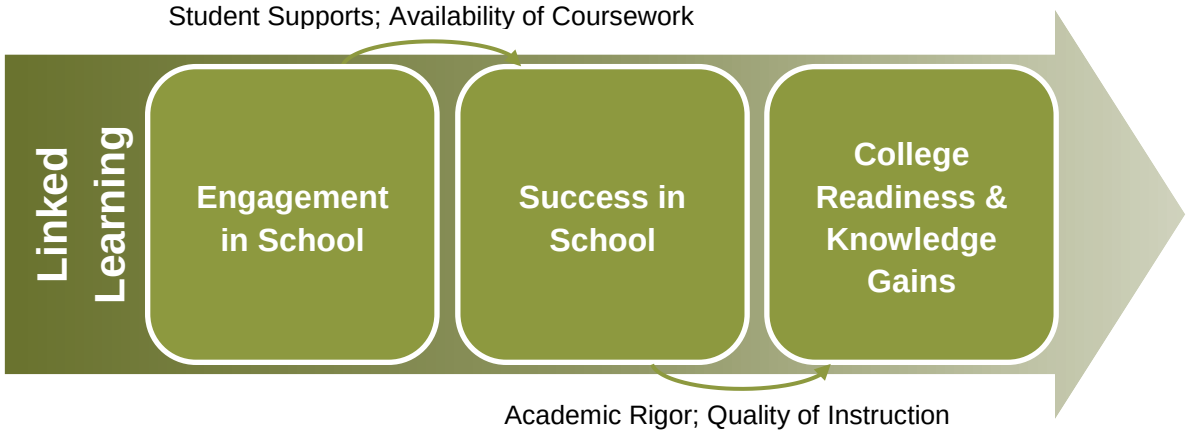
- Certified pathway students were less likely to drop out of high school and more likely to earn a high school diploma than similar peers in traditional high school programs.
- Certified pathway students earned more credits, had higher college-admission grade point averages, and performed better on the English Language Arts Early Assessment Program exam than similar peers in traditional high school programs.
- Certified pathway students were as likely to complete college-prep course requirements as similar peers in traditional high school programs.
- Students with prior low achievement who enrolled in a certified pathway were less likely to drop out, completed more credits and college-prep course requirements, and had higher college-admission grade point averages compared with similar students in traditional high school programs.
- Non-certified pathway students were equally like to drop out and graduate from high school, completed the same number of credits and college-prep course requirements, had comparable college-admission grade point averages, and performed as well on the English Language Arts Early Assessment Program exam compared with similar students in traditional high school programs.

Introduction

In previous chapters, we described the efforts of the nine initiative districts to maintain the quality of their Linked Learning pathways as Foundation funding ends and to ensure that pathways are both accessible to and supportive of all students, regardless of their demographic characteristics or prior achievement. The goal of both these efforts is to create engaging and academically rigorous Linked Learning pathways that support all students to be successful in high school and ultimately to graduate both college and career ready. In this chapter, we examine the extent to which pathways are achieving this goal, overall and for different subgroups of students (i.e., women, English learners, African Americans, Latinos, and students with low prior achievement). As state, federal, and Foundation funding for regional expansion of the Linked Learning approach encourages the development of new pathways beyond the nine initiative districts, it is especially important to understand whether the approach must be implemented with fidelity to achieve optimal results or whether creating career-themed pathways of any quality will be effective. To answer this question, we assessed student outcomes for both certified and non-certified pathways.

Exhibit 6-1 provides a framework for examining how enrollment in a Linked Learning pathway may lead to college-ready graduates. First, the fundamental elements of a Linked Learning pathway—work-based learning, project-based learning, industry themes, and student supports—are designed to increase students' engagement in school beyond what traditional high school models can achieve. In addition to increasing student engagement, the structured nature of a pathway course of study can influence students' course-taking behavior and course completion. Pathway students are generally given a default set of classes that meet high school graduation and college entrance requirements. Such a prescribed curriculum is an example of a "constrained curriculum" that could lead students to enroll in a higher number and a more rigorous set of classes than they might otherwise choose from a "cafeteria-style" curriculum (Lee et al., 1997; Powell, Farrar, & Cohen, 1985). With the right set of classes and appropriate supports, engaged students should be able to graduate from high school eligible to enroll at a CSU or UC school, ready for college and having developed measurable academic knowledge.

Exhibit 6-1
How Linked Learning Affects Student Academic Achievement



For the first time, in this year's report, we are able to provide 12th-grade outcomes—including graduation—for students in all nine districts based on data from the class of 2014. In the coming year of the evaluation, we will be able to add the class of 2015 to this analysis as well. In previous reports, we looked at student outcomes for each grade level of high school. This year, with 12th-grade outcomes from all districts, we take a more longitudinal lens and examine cumulative high school outcomes to provide an overview of the impact the Linked Learning approach has on students throughout their high school careers. We place a particular emphasis on indicators that affect students' college eligibility or signal college readiness. Moreover, because the state did not administer standardized achievement tests in 2013–14, we analyzed fewer measures of academic achievement than in prior years. Finally, to streamline the presentation of results, we eliminated measures that we previously found to be uninformative (i.e., absences and course failures)**.** The sidebar summarizes the differences in outcomes in this report from the fifth-year report.[20] We had also planned to present initial postsecondary enrollment results for the first cohort of Linked Learning graduates, but because of challenges in obtaining data from a sufficient number of districts, we will present these results in the seventh-year report, when we expect to have better coverage of the initiative districts.[21]

Differences in Outcomes from the Fifth-Year Evaluation Report

New to this sixth-year report:

- Graduation
- 10th–11th grade college-admission GPA

Not included in the sixth-year report:

- English language arts (ELA) California Standards Test (not administered in 2013–14 school year)
- Math & ELA California High School Exit Exam (administered in 10th grade; final results available in fifth-year report)
- Attendance
- Course failures

Differently constructed from fifth-year report:

- Dropout replaced retention in district
- Completion of college-prep requirements and credits accumulated aggregated over 4 years of high school instead of calculated separately for each grade level

Overall, we found that the Linked Learning approach did make a difference for high school students, leading to decreased dropout rates and higher graduation rates—although results held only for certified pathways. These findings build on those presented in previous reports, as we have consistently found that certified pathway students completed more credits and remained in their district longer than similar students in traditional high school programs. Even for well-implemented pathways,

[20] See appendix for details.

[21] The challenges associated with linking K–12 and postsecondary data in California are described in Chapter 2.

however, the 2014–15 findings point to areas of growth for the Linked Learning approach. Linked Learning students completed the same number of college-prep requirements as traditional high school students—a concerning finding given the approach's emphasis on college readiness. Students who did complete their college-prep requirements may have had an easier time with the postsecondary transition, however. Linked Learning students earned higher college-admission GPAs, meaning they were more likely to be eligible for admission at California's public 4-year universities. Additionally, Linked Learning students were more likely to pass an exam exempting them from English Language Arts (ELA) remediation at the majority of California's public postsecondary institutions; these findings are encouraging, but we caution that in past years we did not found consistent evidence to suggest that pathways are improving students' academic achievement. Among the subgroups of students analyzed, the positive results for certified pathway students generally held for women, Latino students, and students with low prior achievement. We found that English learners and African American students generally had similar outcomes in pathways and traditional high schools.

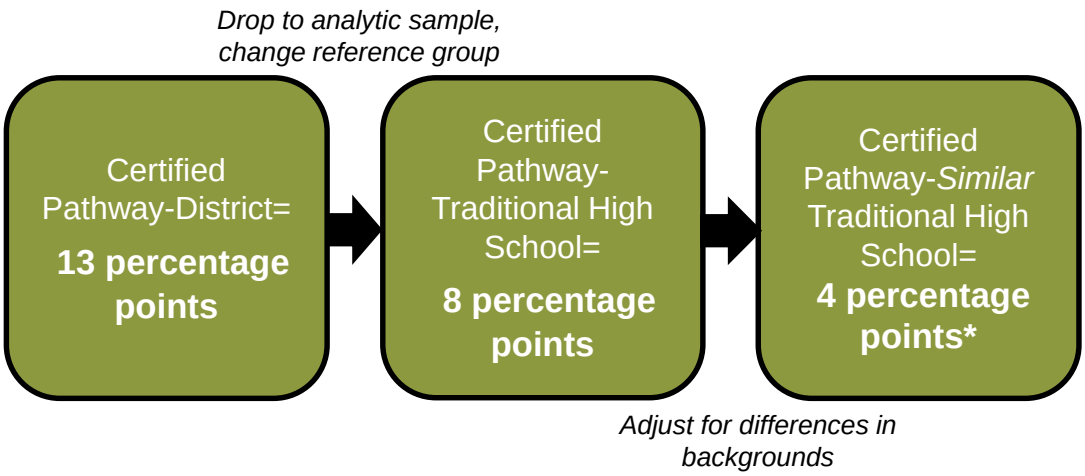
We discuss the data and methods used in this analysis in the text box below. We then present the results of our analyses for students in certified and non-certified pathways compared with similar peers in traditional high schools. Finally, to understand the effect of pathway participation for students in different subgroups, we provide estimates of the effects of pathway participation for subgroup students enrolled in pathways (certified and non-certified) compared with peers in the same subgroup enrolled in traditional high school.

Methods and Data

Data. As in prior reports, we followed the class of 2013 for four districts—Antioch, Long Beach, Pasadena, and Porterville—and the classes of 2014 and 2015 in all nine districts. Data available varied by district and class (see appendix for data availability by outcome measure). For the class of 2015, we present only differences for two outcomes (GPA and the ELA Early Assessment Program exam) because the data traced these students into the 11th grade, so we do not yet have end-of-high school outcomes for them. When we examined course-related outcomes, we excluded dropouts to disentangle the effects of Linked Learning on dropping out from any effects the approach has on outcomes that can be measured only for students who remained in school.

Calculation of differences. Findings presented in this chapter may differ from those generated from publicly available data. The graphic below depicts our approach to calculating the differences provided in this report using the estimated differences in graduation data as an example. We begin by presenting the descriptive difference between the graduation rate of certified pathway students and the overall district graduation rate, unadjusted for any difference in students' characteristics. Descriptively, certified pathway students were 13 percentage points more likely to graduate than average. The graphic then displays the two major steps in our analytic approach. In the first step, we changed the reference group and dropped students without prior achievement data (i.e., standardized test scores the year before the pathway begins). In the second step, we adjusted for differences in student background. Ultimately, we used a multilevel model to compare pathway students with students in traditional high schools who had similar demographic characteristics and prior achievement within the same district. After these analytic steps, the difference in graduation rates decreased from 13 to 4 percentage points. See the appendix for more detail on our methods.

Calculation of Graduation Rate



Classification of students by pathway. As in the fourth- and fifth-year evaluation reports, we determined enrollment based on students' initial pathway choice in 9th or 10th grade, depending on the lowest grade served by the pathway. If students subsequently left the pathway or switched to a different academic program, they remained classified based on their initial enrollment. This approach ensured that any positive findings for pathways did not result because these programs culled struggling students. As discussed in Chapter 5, we know that 73% of certified pathway students and 62% of non-certified students remained in their initial pathway through the beginning of 11th grade, and these retention rates were lower for English learners, special education students, and students with low prior achievement (Exhibit 5-3).

Findings for All Certified and Non-certified Pathway Students

In this section, we first compare outcomes for students who enrolled in certified pathways with those enrolled in traditional high school programs.[22] We then compare outcomes for students who enrolled in non-certified pathways with those enrolled in traditional high school programs.

Interpretation of Results

Throughout this chapter, we compare the outcomes of students in pathways with similar peers in traditional high school programs. When we make these comparisons, we are able to say whether or not the differences in outcomes between the group of interest (e.g., all students in certified pathways) and similar peers in traditional high school programs are large enough to be meaningful. However, we do not at any point formally or statistically compare the differences in these sizes; the point of reference is always the traditional high school population. We do not, therefore, compare the sizes of impact between

- Students in certified and non-certified pathways
- All students and students in a particular subgroup.

Finally, our analyses can neither shed light on nor adjust for ways that any unobserved characteristics such as motivation or parental support differ between pathway and traditional high school students.

Findings for certified pathway students. We began the analysis by asking whether, when well-implemented, the Linked Learning approach provided experiences to all students that made them more likely to graduate from high school ready for college. Below, we first discuss whether participation in a Linked Learning certified pathway was associated with higher rates of high school completion. We then discuss whether participation in a certified pathway was associated with the college readiness of students who remained in school through 12th grade.

High school dropout and graduation. We have consistently found in years of the evaluation that students who enrolled in certified pathways were more likely to remain enrolled in their districts than similar peers in traditional high school programs. Given our previous findings about the positive effect of pathway participation on retention in the district, we would expect students who were enrolled in certified pathways to be less likely to drop out of high school and possibly more likely to graduate from high school than similar peers. We used the following definitions of high school dropout and graduation:

- **Dropout**—We classified students as high school dropouts if they were not enrolled in school in their 12th-grade year.[23]
- **Graduation**—We classified students as having graduated from high school if they earned a traditional high school diploma.[24]

On average, certified pathway students were 1.9 percentage points less likely to drop out of high school and 3.7 percentage points more likely to graduate from high school compared with similar students in traditional high school programs.

[22] We consider a pathway to be certified for a cohort if certification occurred by the end of the cohort's 10th-grade year. Montebello has no certified pathways.

[23] Students who, according to district records, completed the high school curricular program or graduated from high school were not considered to have dropped out, regardless of whether they left the district before their 12th-grade year. Students who transferred to other schools outside the district were excluded from the analysis.

[24] This definition of high school graduation is consistent with the U.S. Department of Education's definition, although the latter requires students to have graduated within 4 years of attending high school; we did not impose such a restriction, although we have data for 5 years for only the class of 2013. Note that using this definition, we did not include students who did not earn a traditional high school diploma, including those who passed the General Education Development test or who completed high school curricular requirements but did not pass the California High School Exit Exam. Finally, we excluded from the analysis students who transferred to other schools outside the district.

Students in certified pathways are less likely to drop out of high school and more likely to earn a high school diploma than similar peers in traditional high school programs.

On average, students in certified pathways were 1.9 percentage points less likely to drop out of high school and 3.7 percentage points more likely to earn a high school diploma than similar students in traditional high school programs. These two findings are closely related in that students must remain in school to earn a high school diploma.

Over the 6-year evaluation, we have consistently found through surveys and focus groups that Linked Learning students report higher levels of engagement in and relevance of school. These positive findings on high school dropout and graduation may indicate that a greater sense of engagement and relevance translates to students remaining in school and earning a high school diploma. We next discuss whether students who participated in certified pathways were more successful in their coursework than similar peers.

Credit accumulation, completion of college-prep requirements, and college-admission GPA.[25] If students who enrolled in certified pathways were more likely to complete high school than similar peers in traditional high school programs, they may have also experienced greater academic success in high school. For this year of the evaluation, we focused on cumulative high school outcomes—credit accumulation, completing college-prep requirements, and college-admission GPA—that are consequential for completion of high school and admission to a California public 4-year university in the UC or CSU system. These outcomes capture student academic success throughout 4 years of high school as well as preparedness for college at the conclusion of high school. We define these outcomes as follows:

- **Credit accumulation**—This was defined as the number of course credits passed through the end of students' 12th-grade year. In California, students are required to complete 220 credits to be eligible to graduate from high school.
- **Completion of college-prep course requirements**—To be admitted to a public 4-year university in California, students must complete a set number of designated college preparatory courses across academic subjects and earn a grade of C or better in each course—these courses are collectively referred to as the *a–g requirements*. We defined this outcome in two ways. First, we looked at whether students completed all a–g requirements. We next analyzed the number of a–g requirements completed to determine the extent to which certified pathway students were making greater progress toward meeting a–g requirements.[26]
- **College-admission GPA**—A student's GPA in the 10th– through 11th-grade a–g courses has important implications for admission to California's 4-year public universities. Students must earn a 3.0 GPA to be eligible for the UC system. Students qualify for admission to the CSU system with a GPA of 3.0 or higher and are ineligible for admission with a GPA below 2.0.[27] The eligibility of students with GPAs between a 2.0 and a 3.0 depends on ACT or SAT scores. Our calculation of GPA closely mirrors the CSU system's formula to calculate high school GPA for applicants.[28]

[25] The lack of standardization in grading across academic programs makes GPA a problematic outcome measure when comparing students in different academic programs (U.S. Department of Education, 2013). We therefore recommend not interpreting any estimated impact of Linked Learning on student GPA as a measure of academic success or noncognitive skill (as suggested in Farrington et al., 2012). However, student GPA impacts eligibility in UC and CSU admission without regard to academic program; we therefore interpret analyses of the impact of Linked Learning on CSU GPA in light of this role.

[26] See the appendix for the list of a–g requirements

[27] For a full CSU eligibility index, see https://secure.csumentor.edu/planning/high_school/cal_residents.asp

[28] In calculating applicants' high school GPA, the CSU system assigns additional points to honors courses. Because we cannot identify honors courses in our data, we did not make any modifications for them in our calculation of GPA. For this reason we also did not calculate differences in eligibility based on meeting a particular GPA threshold.

As mentioned, we included in the analysis only students who remained in high school. We did this to disentangle the effect of participation in a certified pathway on course-related outcomes from high school dropout. That is, we wanted to ensure that course-related outcomes were driven by the experiences students had while in school, not by their absence from school. In addition, we were not able to use the course files from three districts, so this analysis is based on students from six of the district in the initiative.[29]

Over the 4 years of high school, students in certified pathways accumulated more credits than similar peers in traditional high school programs.

On average, certified pathway students completed 13.3 more credits—or 2.6 more courses—than similar students in traditional high school programs.

Consistent with findings in prior years of the evaluation, students who enrolled in certified pathways accumulated, on average, 13.3 more credits than similar peers in traditional high school programs—equivalent to 2.6 more courses over the 4 years of high school.[30] Students must complete 44 courses to be eligible to graduate from high school; thus, in terms of total high school coursework required for graduation, a 2.6 course difference represents approximately one-half of a semester of coursework.

Certified pathway students are equally likely to complete college-prep requirements during high school compared with similar students in traditional high school programs.

We did not find statistically significant differences in a–g course completion for students in certified pathways and traditional high school programs. Certified pathway students and similar traditional high school students were equally likely to complete all a–g requirements. When estimating whether certified pathway students made greater progress toward a–g completion as measured by the number of requirements completed, we estimated that certified pathway students completed 0.8 more a–g courses than similar peers, but this difference was estimated imprecisely enough that it may have arisen by chance. In interpreting this finding, it is important to consider that pathway students have the demands of completing a career technical course sequence in high school in addition to the more traditional academic curriculum. We found no evidence, however, that these additional requirements were interfering with pathway students' completion of the a–g requirements. In addition, the null findings regarding a–g completion should be considered in conjunction with the finding that certified pathway students were 1.9 percentage points less likely to drop out of high school relative to their peers in traditional high school. In this year of the evaluation, we only analyzed a-g completion for students who remained in school through the 12th grade. Together these findings suggest that certified pathways are doing just as well helping students complete the a–g requirements even as they retain students who might otherwise have left high school prior to senior year and are unlikely to pursue the full college-prep curriculum.

In prior reports, we have presented mixed evidence about the effect of participation in a certified pathway on students' progress toward meeting a–g requirements. In the fifth-year report, we found that certified pathway students in the 10th grade were more likely to be on track to complete a–g requirements than similar peers, but there were no statistically significant differences for students in the 9th and 11th grades. One key difference this year is that we accounted for high school dropout. Prior findings that students in certified pathways were more likely to be on track to complete a–g requirements may have been driven by the greater likelihood that students in traditional high school dropped out of school (and thus did not earn a–g credits). This year's a–g findings suggest that participation in a certified pathway does not increase the likelihood that students will complete a–g requirements beyond increasing the likelihood that students stay in high school.

[29] Students from Antioch, Oakland and Sacramento are not included in the analyses of credit accumulation or a–g completion.

[30] Prior evaluations typically provided larger estimated differences for each of ninth–11th grades. The difference in size of this year's estimate compared with that of prior years is probably due to the exclusion of students who dropped out before 12th grade.

Although a–g completion data provide valuable information on students' academic readiness for college, they do not tell us conclusively whether a pathway's course of study meets a–g requirements. Qualitative data suggest that most pathways provided students with access to some of the a–g approved classes needed to fulfill the course requirement through the pathway program of study. The lack of a–g approved pathway CTE courses and the lack of a foreign language course remained barriers to pathway students completing 4-year college entrance requirements within their pathway program of study. Consequently, to fulfill the a–g course requirement, pathway students must complete some required courses outside the pathway and may miss out on the full pathway experience. As we reported last year, districts have been responding to this deficiency by revisiting pathway courses of study and revamping CTE courses to meet a–g standards by working with the county office of education, the Career Academy Support Network, or the UC Curriculum Integration program. According to the California Department of Education (2014), the number of a–g approved courses in the state has been climbing steadily since it began tracking in 2000. However, getting approval is only the first step; another obstacle to offering a–g approved classes mentioned in 2014–15 was the ability of districts to find the appropriate CTE staff to teach career-themed a–g approved courses. There are shortages of qualified CTE teachers, and getting individuals fully credentialed as a Designated Subjects CTE teacher can be a lengthy process for staff who have not come through a teacher credential program. One approach to dealing with this obstacle was to have an adjunct professor from the community college teach the course because the college had access to qualified CTE faculty.

On average, certified pathway students had CSU GPAs that were 0.14 points higher than those of similar students in traditional high school programs.

Certified pathway students earn higher college-admission GPAs than similar peers in traditional high school programs.

Although certified pathway students were not more likely to complete a–g requirements than similar peers, they earned higher grades in a–g courses. On average, certified pathway students had CSU GPAs that were 0.14 points higher than similar students in traditional high school programs. Certified pathway students who completed all a–g requirements were therefore more likely to be eligible for admission to a 4-year California public university.

ELA Early Assessment Program Exam. We used performance on the CSU's ELA Early Assessment Program (EAP) exam as a measure of students' mastery of course content and readiness for college-level work in ELA. In prior years of the evaluation, we found few differences between certified pathway and traditional high school student performance in ELA or math on standardized tests. In the fifth-year report, we evaluated student performance on the California Standards Test (CST), the California High School Exit Exam (CAHSEE), and the CSU's ELA EAP exam and found certified pathway students slightly outperformed similar peers on the ELA CAHSEE and no other effects of participating in a certified pathway on standardized test scores. In this report, we analyze new student performance data on the CSU's ELA EAP exam.

- **Readiness for college work in ELA:** Students' readiness for college work in ELA was indicated by a ready or conditionally ready status on the ELA EAP exam. Students have the option to take this exam in their 11th-grade year. We included only districts and cohorts for which at least 50% of students took the EAP test in this analysis.[31]

Students in certified pathways are more likely to be classified as ready or conditionally ready for college work in ELA than similar peers in traditional high school programs.

On average, certified pathway students were 5.3 percentage points more likely to be classified as ready or conditionally ready for college in ELA compared with similar students in traditional high school programs. This finding should be interpreted with caution. First, as noted, with the exception of student

[31] Districts and cohorts that were included in the analysis are the classes of 2013, 2014, and 2015 in Antioch; the classes of 2013 and 2014 in Long Beach; the classes of 2014 and 2015 in Montebello; the class of 2014 in Oakland; the classes of 2013 and 2014 in Pasadena; the classes of 2013, 2014, and 2015 in Porterville; the classes of 2014 and 2015 in Sacramento; and the class of 2014 in West Contra Costa.

performance on the ELA CAHSEE, this finding is inconsistent with prior findings regarding student performance. Second, this student sample represents a limited number of districts and cohorts. Finally, the EAP exam is optional, so not all students take it. One mechanism by which students in certified pathways might be more likely to pass this exam is if teachers or pathway policy encouraged more students capable of passing the exam to take it.[32] Regardless of the mechanism by which this outcome occurs, if certified pathway students consistently outperformed similar peers on this measure, then certified pathway students might be less likely to be remediated in their postsecondary work, removing a difficult barrier to postsecondary academic success for some students.

Overall, we found that Linked Learning certified pathway students were more likely to graduate and less likely to drop out than their peers in traditional high school. Linked Learning graduates were no more likely to complete college-prep course requirements. However, higher college-admission GPAs and increased probability of passing the ELA EAP exam will ease the transition to postsecondary for some of these students. We next turn to outcomes for students in non-certified pathways to understand whether these findings hold for students in career-themed pathways with a wide range of adherence to the Linked Learning approach.

[32] In the analytic sample of the districts included in this estimation, 79.7% of certified pathway students took the EAP exam compared with 69.7% of the traditional high school students.

Findings for non-certified pathway students.
State, federal, and Foundation funding for regional expansion of the Linked Learning approach is encouraging the development of new pathways beyond the nine initiative districts. As these policy efforts unfold, it is increasingly important to understand whether the Linked Learning approach must be implemented with fidelity to achieve optimal results or whether creating career-themed pathways of any quality will be equally effective. During our site visits and interviews, we observed a wide range of pathway quality within the districts. Some non-certified pathways emphasize continuous improvement and fidelity to the Linked Learning approach, whereas others have little in common with Linked Learning certified pathways save a career theme. In this section, we ask whether career-themed pathways of any quality graduate college-ready students more frequently than traditional high schools.

Identification of Non-certified Pathways

For this analysis, we included any career-themed pathways identified by districts as "non-certified pathways." Interviews with district staff indicated that pathways in this category cover a wide range of adherence to the Linked Learning approach. Some pathways are themed in name only, whereas others are nearing certification. We believe this wide range of adherence to the Linked Learning approach translates to a wide range in the quality of non-certified pathways within the districts. Our findings may therefore help inform districts debating the value of pathway certification and continuous improvement.

To answer this question, we estimated differences between non-certified pathway students and similar traditional high school students for all outcomes described above: dropout, graduation, credit accumulation, college-prep course requirement completion, college-admission GPA, and the ELA EAP exam. Overall, we found that students who participated in non-certified pathways generally fared no worse than similar peers in traditional high school programs, but participation in a non-certified pathway did not result in improved outcomes for students on any of these measures. Similar to findings from the fifth year of the evaluation, there were no statistically significant differences in outcomes for students in non-certified pathways compared with those of similar peers in traditional high schools (see appendix for complete results).

The lack of positive findings for students in non-certified pathways may be due to a number of factors. Although some non-certified pathways may adhere closely to the Linked Learning approach, others may not substantially differ from traditional high school programs. Further, as explained in Chapter 5, students were less likely to remain in non-certified pathways through the 11th grade, making them less likely to reap the benefits of pathways. Although the certification process itself may not be imperative for a pathway to improve student outcomes, our findings suggest that the pathway designation alone was inadequate to achieve positive effects on student outcomes. Certification indicates that a pathway has certain structures in place (e.g., work-based learning systems, course sequencing). When these structures are in place and with the greater retention of students in certified pathways, we observed positive effects of pathway participation on high school graduation and college eligibility.

Students who participated in non-certified pathways generally fared no worse than similar peers in traditional high school programs, but participation in a non-certified pathway did not lead to improved results for students on any of the outcomes measured.

We next turn our attention to findings on these outcomes for subgroups of students enrolled in certified and non-certified pathways.

Findings by Student Subgroup

The results presented in the preceding section indicate that students in certified pathways were more likely to complete high school, earned more credits and higher college-admission GPAs, and passed the ELA EAP exam at higher rates than similar peers in traditional high schools. Participation in a pathway, however, 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. Analyzing results by subgroup is particularly important when evaluating initiatives that create multiple small learning communities (such as Linked Learning pathways), because the literature suggests that this type of reform, if implemented poorly, can exacerbate educational inequality by increasing the stratification among pathways by race, class, gender, or prior academic achievement (Lee & Ready, 2007a). When well implemented, however, pathways may offer particular advantages for some traditionally underserved groups.

Theoretically, subgroup results may not replicate overall results for two reasons. First, pathway enrollment may differentially affect students in subgroups. This differential impact can be either positive or negative and may depend on the subgroup. For example, the literature suggests that pathways' prescribed course of study may be particularly beneficial for disadvantaged students, who might otherwise find themselves tracked into lower level classes in a traditional high school setting (Fowler & Walberg, 1991; Howley & Howley, 2004; Lee & Smith, 1997; McMillen, 2004). These students may also find the real-world relevance and greater structure and supports provided by a certified pathway key to thriving in school. On the other hand, students who need specialized supports may not thrive in pathways that are unable to offer them. For example, high school counselors have reported that English learners' scheduling conflicts due to required language classes can prevent these students from fully participating in a pathway's course sequence. This inability to fully participate in the course sequence with pathway peers—including the interdisciplinary projects offered across these classes—may temper the effect of pathway enrollment on outcomes for these students.

The second reason that subgroup results may not replicate 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. Moreover, we know from the fifth year of the evaluation that female students disproportionately enroll in health pathways and are less likely to enroll in engineering pathways. As a result, differences in pathway quality between health and engineering pathways could change outcomes for female students.

To address these concerns, we analyzed the impacts of pathway participation for student subgroups of interest, namely, African Americans, Latinos, English learners, and students with low prior achievement.[33] In addition, given the finding in the fifth year of the evaluation that women tend to select different pathway themes than their male peers, we included female students as an additional subgroup.[34] As discussed in the "Methods and Data" section we did not directly compare the size of subgroup effects with overall effects, but we did highlight cases where the direction of subgroup results differed from overall results. We present findings for students in both certified and non-certified pathways, although there were few statistically significant findings for students in non-certified pathways, similar to the results for the overall sample.

[33] We limited the sample to students in the subgroup of interest and then compared outcomes for certified and non-certified pathway students with those of traditional high school students for similar students in the subgroup. Not all districts and certified pathways are represented in the analyses presented in this section, as student populations vary by district and subgroup.

[34] Although both special education and low socioeconomic status students are also of interest in this initiative, we chose not to run separate analyses for either group. Special education students constituted 8% of our analytic sample. This sample size was too small to conduct a separate analysis using the same methods as elsewhere in this chapter. Low socioeconomic students accounted for a majority of our sample—79%—and results therefore closely mirror those of the overall sample.

Students with low prior achievement. For the initiative to reduce the achievement gap within district schools, impacts of Linked Learning must be felt most dramatically by students with low prior achievement. We defined low prior achievement as receiving a below basic or far below basic proficiency level designation on the ELA CST exam before entering the pathway or traditional high school program. Approximately one-quarter of students in the sample met this definition upon entering high school.

Participation in a certified pathway appears to have a strong impact on outcomes for students with low prior achievement compared with similar peers in traditional high school programs.

Findings for certified pathway students with prior low achievement largely mirrored positive outcomes for all students. On average, certified pathway students with low prior achievement were 4.1 percentage points less likely to drop out, accumulated 21.8 more credits, and had GPAs 0.16 points higher than similar peers in traditional high school programs. Additionally, certified pathway students with low prior achievement completed, on average, 1.9 more a–g requirements than similar peers in traditional high schools. The sizes of these differences indicate that participation in a certified pathway had a meaningful impact on outcomes for students with low prior achievement.

On average, students with low prior achievement in certified pathways were 4.1 percentage points less likely to drop out, accumulated 21.8 more credits, completed 1.9 more a–g courses, and had GPAs that were 0.16 points higher than similar peers in traditional high school programs.

Results for students with low prior achievement, although promising, were not universally positive. Because of the small number of students with low prior achievement who either passed the ELA EAP exam or completed the full set of college-prep requirements in either pathway or traditional high school settings, we were unable to estimate any differences on these outcomes, a technical barrier that points to the real-world difficulty of preparing these students to graduate college ready. Although the estimated difference between graduation rates for Linked Learning certified pathway students and traditional high school students was 6.8 percentage points, this difference was estimated imprecisely enough that it may have arisen by chance.[35] Finally, students with low prior achievement enrolled in non-certified pathways did not differ from similar students in traditional high schools on any outcomes. Taken together, this year's findings suggest that participation in a certified pathway may lead to a number of positive benefits for students with low prior achievement—a subgroup for whom the Linked Learning approach may particularly well suited. As discussed, these are students who—absent the prescribed pathway course of study—may find themselves tracked into lower level classes in a traditional high school setting and thus experience a more rigorous and engaging education as a result of enrolling in a pathway.

English learner students. We know from interviews with college counselors that scheduling English learners into the full pathway course sequence can be a challenge given additional curricular requirements (e.g., English language development support), potentially limiting the extent to which these students fully engaged with the Linked Learning approach. For the purposes of these analyses, we classified students as English learners based on their eighth-grade designation. English learners constituted approximately 21% of the analytic sample. Although pathways in all districts enroll English learners, they represent more than one-third of certified pathway enrollment in West Contra Costa and Los Angeles.

[35] In this report, we use the standard $p < .05$ threshold to determine statistical significance. Under this standard, these results would be considered marginally significant at $p < .1$.

English learner students in certified pathways earn more credits than similar peers in traditional high school programs; however, no other outcome is statistically significant for this subgroup.

On average, English learner students in certified pathways earned 15.2 more credits—equivalent to three additional courses—than similar peers in traditional high school programs. Given the small number of students in this population who either passed the ELA EAP exam or completed the full set of college-prep course requirements, we were unable to estimate any differences on these outcomes for English learners. We found no other observable effects of pathway participation on student outcomes for English learners in either certified or non-certified pathways.

On average, English learner students in certified pathways earned 15.2 more credits—equivalent to three courses—than similar peers in traditional high school programs.

These findings suggest that English learner students may not experience the full benefits of participating in a certified pathway. Although the evidence suggests that certified pathways largely did not improve outcomes for English learner students, English learner students who participated in pathways fared as well as those who attended traditional high schools, implying that pathways were as accommodating of English learners' needs as traditional high school programs.

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 serve African American students, who face the lowest high school graduation and highest unemployment rates of any racial or ethnic group (Bureau of Labor Statistics, 2015; National Center for Education Statistics, 2015). African American students comprised approximately 15% of the overall sample.

African American students in certified and non-certified pathways earn more credits than those in traditional high school programs, and African American students in non-certified pathways are more likely to graduate from high school than similar peers.

We observed few effects of pathway participation on outcomes for African American students. [36] On average, African American students in certified pathways earned 29.3 more credits—nearly six courses—than similar students in traditional high school programs. However, there were no other observable effects of certified pathway participation on outcomes for African Americans; even though they earned more credits, we saw no evidence that African American students in certified pathways were more likely to earn a high school diploma than similar peers in traditional high school.

On average, African American students in certified pathways earned 29 more credits—nearly six courses— than similar students in traditional high school programs.

African American students were the only group for which we found any significant differences for non-certified pathway students. On average, African American students in non-certified pathways earned 13.0 more credits—2.6 courses—and were 4.0 percentage points more likely to graduate than similar peers. There were no other statistically significant findings for African Americans in non-certified pathways.

Although the literature on small learning communities suggests that African American students may benefit from less anonymous school settings with a more prescribed course of study, neither extant research nor our qualitative findings point clearly to a reason why non-certified pathways might be more effective for African American students than for other subgroups. We are left with the possibility that African American students may be enrolling in the higher quality of the districts' non-certified pathways.

[36] We were unable to estimate differences in ELA EAP passage rates for African American students; this difficulty in estimation was caused by a small sample with few level-2 units and numerous covariates. When we estimated a simpler multiple linear regression model that did not take into account the multilevel structure of the data, there were no effects of pathway participation on passing the ELA EAP exam for African American students.

Latino students. Latino students compose the largest racial or ethnic group in the nine districts and face the second lowest graduation and employment rates in the United States, following African American students. Latino students represented 58% of students in the sample. Approximately one-third of the Latino population is classified as English learners.

On average, Latino students in certified pathways accumulated 13.9 more credits and had GPAs that were 0.12 points higher than similar peers in traditional high school programs.

Findings for Latino students mirrored the findings from the overall sample—probably because Latino students constituted the majority of the overall student sample. On average, Latino students in certified pathways accumulated 13.9 more credits and had GPAs that were 0.12 points higher than similar peers in traditional high school programs. Yet Latino students in certified pathways did not outperform similar peers on the ELA EAP exam and their likelihood of dropping out, while lower than that of their counterparts in traditional high school, was not statistically significant. Latino students in certified pathways were were 4.0 percentage points more likely to graduate than similar students in traditional high schools, but these results were estimated imprecisely enough that they may have arisen by chance.[37] There were no statistically significant findings for Latino students in non-certified pathways.

Female students. Findings for female students mirrored overall results—probably because female students constituted half of all students in the sample and were evenly distributed across districts.

Female students in certified pathways were less likely to drop out, more likely to graduate, and earned more credits than similar students in traditional high school programs. Female students in certified pathways earned similar ELA EAP exam scores and GPAs as their counterparts in traditional high school. There were no statistically significant findings for female students in non-certified pathways. Given that female students enroll in different career-themed pathways than their male peers, the fact that these results mirror those of the overall population provides evidence that neither gender nor pathway theme interfere with the positive benefits of Linked Learning.

On average, female students in certified pathways were 2.0 percentage points less likely to drop out, were 4.3 percentage points more likely to graduate, and accumulated 14.1 more credits than similar peers in traditional high school programs.

Implications

In this chapter, we examined whether the Linked Learning approach graduates college-ready students. Overall, we found that Linked Learning certified pathway students were less likely to drop out and more likely to graduate than similar students in traditional high school programs. Increasing the graduation rate of pathway students is a critical initiative accomplishment given recent economic trend data indicating that high school graduates earn approximately 60% more than high school dropouts (U.S. Census Bureau, 2009). Although increasing graduation rates is a necessary first step to positively affecting the life chances of the students served, it is also important that Linked Learning graduates be adequately prepared to transition to college or careers. With regard to college readiness, certified Linked Learning pathways appear to be achieving more mixed results. Although they earned more credits, Linked Learning students were not more likely than similar students in traditional high schools to complete college-preparatory course requirements for public 4-year colleges and universities in California. However, those certified pathway students who did complete all requirements will have any easier time with the postsecondary transition, given higher average college-admission GPAs and greater chances of having passed the ELA EAP exam, exempting them from remediation at the majority of California's postsecondary institutions.

[37] In this report, we use the standard $p < .05$ threshold to determine statistical significance. Under this standard, these results would be considered marginally significant at $p < .1$.

It is important to note, however, that these positive graduation benefits accrue only to students in certified pathways. Given recent state, federal, and Foundation efforts to expand the Linked Learning approach, it will be important for new districts implementing the Linked Learning pathways to attend to quality. Incorporating only the shallowest elements of the approach—a small school with a career theme, for example—will not provide students with the same benefits provided those enrolled in a certified pathway. The null findings for non-certified pathways validate the efforts of Linked Learning directors in the nine initiative districts to temper the pace of the expansion within their own districts, urging leadership to invest in pathway quality over quantity.

Our analysis of student subgroups indicates that the Linked Learning approach is having a strong impact on the students who enter high school with poor academic skills. These students may find the real-world relevance, increased personalization, and prescribed course of study provided by a certified pathway to be helpful. This is of particular interest given the Foundation's focus on improving the outcomes of disadvantaged and underserved student populations. On the other hand, it appears that the positive effects of enrolling in a Linked Learning pathway do not hold for English learners. Qualitative data suggest that these null findings may be caused by an inability to fully participate in pathway courses because of scheduling conflicts with required language classes. Although we were not able to analyze results for special education students because of small sample sizes, the results for English learners suggest that if pathways are to be effective for students needing specialized supports, teachers will need to find ways to provide these supports within the pathway course of study.

In the coming year, we will add another cohort to our analysis of end-of-high school outcomes (the class of 2015) and will report on how well Linked Learning graduates fare compared with similar peers as they transition to postsecondary endeavors.

Chapter 7: Conclusion

This report examines Linked Learning at a transitional moment, as the Irvine Foundation shifts from a district-focused demonstration project to a regional hub strategy aimed at supporting the expansion of Linked Learning across California. Momentum for regional expansion is one measure of success for the Linked Learning initiative. CCPT grants have provided $250 million in state funds that regional consortia are targeting on two of the Foundations' priorities: developing work-based learning and strengthening partnerships between secondary and postsecondary schools. This investment reflects the extent to which state policymakers view Linked Learning as a promising strategy for ensuring that students complete high school well prepared for college and career.

In this concluding chapter, we discuss the implications of this shift for Linked Learning pathways. We draw primarily on this year's data collection but also consider the experiences of the nine districts in the initiative over the past 6 years of implementing Linked Learning. We begin with a discussion of work-based learning and postsecondary partnerships, the two areas that stand to benefit the most from the shift to a regional strategy to support Linked Learning implementation. We then turn to the tension between deepening pathway quality and pathway expansion. Finally, we discuss barriers that need to be addressed at the state level to allow Linked Learning to capitalize on dual enrollment, a promising strategy for postsecondary success.

Strengthening Linked Learning: Work-Based Learning and Postsecondary Partnerships

The Foundation's shift to a regional hub strategy holds great promise to strengthen two elements of Linked Learning that have proven difficult to tackle at the district level: work-based learning and postsecondary partnerships. The regional hub approach provides an opportunity for industry, communities, and schools, as well as for districts and postsecondary institutions, to form productive partnerships.

First, CCPT grants have the potential to establish deeper and more effective support systems for work-based learning. These grants are allowing districts to share the responsibilities for developing work-based learning opportunities with multiple partners. Districts are also using CCPT funds to establish regional intermediary organizations that may be better positioned than districts to develop industry partners, work that is not part of the traditional role of district staff and teachers.

Second, CCPT grants are helping districts engage community college partners in deepening existing partnerships and building new ones. Launched by the Foundation-funded California Community College Linked Learning Initiative, districts such as Pasadena and West Contra Costa are creating career pathways that reach from high school into college. CCPT funds have spurred community colleges and districts to work together to expand opportunities for students to earn college credit while in high school. Further, they have helped districts such as Long Beach create regional articulation agreements with local community colleges, ensuring that students can choose from multiple colleges that will honor the college credits they earned while in high school.

Despite all this promise, however, we sound a note of caution with regard to work-based learning. The goal of Linked Learning is to help more students graduate from high school ready for college and careers, whether that means obtaining a bachelor's degree, community college degree, or a shorter term certificate. Stronger work-based learning infrastructure cannot lead to improved outcomes unless these systems are linked to pathway curriculum and instruction. This linkage has been a challenge for pathways in the initiative. In the fifth-year evaluation report, we noted finding little evidence of systematic integration of work-based learning experiences with academic and technical coursework (Guha et al., 2014). In our review of integrated projects for this report, we found that work-based learning was consistently included as a project component in only one district (Porterville).

Pathway teachers need the support that the regional efforts promise to offer in terms of setting up a greater number and breadth of work-based learning experiences. But without explicit attention to tying work-based learning back to curriculum and instruction, these experiences risk becoming isolated add-ons with little connection to pathway curriculum. If work-based learning is to realize its potential to help students "master and demonstrate academic, technical, and 21st century skills" as outlined in Linked Learning's Essential Elements for Pathway Quality (ConnectEd, n.d.), students need to have these experiences scaffolded in the classroom. For this to happen, teachers need time to plan together how these experiences will link to students' pathway courses and to develop strategies for helping students reflect and learn from these experiences so that they graduate with the communication and self-management skills they need to obtain a job and succeed in the workforce. In 2014–15, we saw that pathways in districts with clear guidelines and strong technical assistance in the form of coaching on integrated projects implemented more robust integrated projects than those that did not have these resources. These kinds of supports—such as the sector coaches paid for with CCPT funds to help teachers integrate work-based learning in Sacramento—could help ensure that work-based learning is more broadly integrated into pathway curriculum.

Further, as Linked Learning expands within regions, the regional organizations funded by the Foundation and through CCPT will be serving a growing number of pathways. As the demand for work-based learning increases, these organizations may find themselves pushed to prioritize quantity over quality. ConnectEd defines a work-based learning continuum, with career exploration opportunities such as speakers and field trips in the early years of high school and internships and other more substantive experiences in the upper grades. Yet pathways within the district initiative have been more successful at offering opportunities at the lower end of this continuum than at the upper end. Without some counterpressure to focus on developing opportunities at the higher end of the continuum, work-based learning risks becoming a speaker series for all pathways.

Tension Between Pathway Quality and Expansion

The need to link the work being done to develop partnerships and systems at the regional level back to the classroom emerged as a central theme from this year's data collection, as did the tension between the push to expand Linked Learning and efforts to maintain the quality and integrity of the approach. The experiences of the nine districts in the initiative have demonstrated that establishing quality Linked Learning pathways is hard work, even with the significant investment of the Foundation. In particular, district leaders have struggled to figure out how to configure pathways to provide the individualized academic supports that are a key component of Linked Learning; once again this year, we found that these supports are often provided ad hoc by pathway teachers. High schools that house pathways have struggled to provide students with the dedicated pathway course sections that enable teachers to implement integrated curriculum and projects. Thus, after the past years of growing Linked Learning in their districts, the Linked Learning directors are slowing growth and concentrating on quality.

This question of quality is particularly important given the findings that students in non-certified pathways do not experience the same advantage in graduation rates and credit accumulation as students in certified pathways compared with their similar peers in traditional high school. Quality matters when it comes to Linked Learning pathways. A regional focus promises increased systems infrastructure support for Linked Learning, but it is ultimately how pathway teachers teach that will make the most difference for student outcomes.

Effecting instructional change for teachers is challenging. Nonetheless, our review of integrated projects revealed that teachers in certified pathways are implementing project-based learning and integrated instruction, even if these efforts fall short of the standards set by ConnectEd. Further, in the past two years of our evaluation, we have seen that students in certified Linked Learning pathways are more likely than their peers in traditional high schools to report developing 21st century skills such as collaboration and communication skills, suggesting that these efforts at curriculum integration are making a difference (Guha et al., 2014). Maintaining these instructional shifts will require sustained effort. If Linked Learning pathways are to continue to represent a true change in teaching and learning for California high school students, the focus of regional expansion will need to be not just on the policy and partnerships to support

Linked Learning, but also on the teachers who ultimately determine the experiences of Linked Learning students. To achieve their full potential in transforming student learning, Linked Learning, as well as the Common Core standards, require that teachers of all core subjects and technical courses deeply understand and reflect on what they are teaching and how they are teaching it. This major undertaking cannot be achieved overnight but will instead be a gradual and iterative process that requires sustained focus and patience.

In the 2014–15 school year, as they contemplated the end of Foundation funding for the initiative, we saw many Linked Learning directors turn to pathway self-assessment as the primary vehicle of assuring quality, prioritizing self-directed use of the OPTIC tool or other self-assessment tools over a formal certification process provided by NAF or ConnectEd. Although this focus on quality is encouraging, developing pathways will need support as they go through a self-assessment process. Without an external partner to help pathway teachers reflect on the successes and challenges of their work, the process can become an exercise in compliance. Until the technical assistance related to the regional hub strategy is clearer, the nine districts in the initiative do not know what, if any, continued support they can expect to help ensure pathway quality. Linked Learning directors in the district initiative understand the expectation, explicit in the CCPT grants and regional hub strategy, that they will serve as a resource to districts attempting to develop new Linked Learning pathways. At the same time, they are working to develop systems to support a continued focus on pathway quality in their own districts. This year, we saw evidence that taking on responsibility to mentor and guide other districts has sometimes strained initiative districts' capacity to devote full attention to maintaining quality in their own Linked Learning system. As the regional hub strategy unfolds, technical assistance aimed not only at higher level partnerships and systems but also on the cycle of continuous reflection and improvement needed to develop quality pathways could help ensure that the districts in the initiative are able to continue to deepen their own implementation of Linked Learning even as they help others adopt the approach.

State Policy Barriers

A number of barriers to fully realizing the potential of the regional hub strategy, particularly related to postsecondary partnerships, must be addressed at the state level. Although CCPT funds are spurring greater collaboration between postsecondary institutions and school districts, a number of state-level policies may hinder the ability of these consortia to fully realize some successful strategies to support students' postsecondary success. The partners involved in regional consortia can do nothing to change these barriers at the local level but will need the help of the Linked Learning Alliance to advocate for change at the state level.

The first barrier concerns placement into remedial coursework in the CSU system. CSU campuses, unlike California community colleges, do not have the flexibility to innovate locally to define placement policies that determine whether students can enroll directly in credit-bearing courses when they start college. Individual community colleges and groups of community colleges can and are working to innovate on placement policies to ensure that students are not unnecessarily placed in remedial courses when they could be successful in credit-bearing courses. For example, districts such as Long Beach are working with their local community college district to lower remediation rates and increase student success in college by using multiple measures, including course grades, to determine student placement in college-level work. Because the CSU Chancellor's Office sets placement policies for the CSU system, however, any similar move away from using a single placement test to determine the need for remedial coursework by CSU campuses will need statewide support.

A second set of barriers prevent pathways from significantly expanding dual-enrollment offerings. First, although community colleges have the flexibility to set placement policies locally, this local control does not extend to the establishment of new dual-credit offerings. The approval process for new dual-credit courses, which resides with the California Community Colleges Chancellor's Office, is lengthy, creating a barrier to expanding dual-enrollment course offerings. Streamlining this process will require action on the part of the Chancellor's Office. Second, the Chancellor's Office issues minimum qualifications for community college faculty, which include a masters' degree in the discipline for most subjects (California Community Colleges Chancellor's Office, 2014). These requirements hold for college credit-bearing

courses regardless of where they are taught. High school teachers commonly have master's degrees in education but not as commonly in the discipline they teach. If high school teachers do not meet these criteria, then districts have to seek college faculty to teach dual-credit classes; some districts have found college faculty to be disinclined or ill-prepared to teach high school students. This requirement makes it difficult for high schools to staff dual-credit offerings.

Combined, these barriers to the expansion of dual enrollment mean that Linked Learning cannot fully leverage what has proven to be an effective strategy to foster postsecondary success. Research suggests that students who enroll in dual-enrollment programs are less likely to take basic skills courses in college and are more likely to persist in postsecondary education than comparison students (Hughes et al., 2012; Struhl & Vargas, 2012). Dual-enrollment programs may be particularly effective when they provide the opportunity for students not simply to earn a few college credits on an ad hoc basis but to work toward a college degree. For example, Early College High Schools allow high school students to simultaneously pursue a high school diploma and an associate's degree at low or no cost to the student. An experimental study of ten Early College High Schools in Texas found that Early College students were more likely than comparison students to succeed in both high school and college, including having higher college enrollment rates (Berger et al., 2013). For Linked Learning pathways to leverage this more comprehensive approach to dual enrollment would require a significant expansion of dual-enrollment opportunities in California, such that dual-credit courses could be central to pathway curricula. This expansion would only be possible with the removal of these barriers. Recent legislation (AB288) is a promising step toward realizing this expansion. By formalizing College and Career Access Pathways between school and community college districts with a standardized agreement, school districts will be able to offer dual-enrollment courses with a wider range of local community college partners.

Finally, California does not have a state longitudinal system that includes the three public postsecondary systems, making it difficult to track students' postsecondary outcomes. Lacking a state database, Cal-PASS Plus, an initiative of the California Community Colleges Chancellor's Office, houses the most comprehensive longitudinal data system for the state but does not include indicators of students' high school pathway or program, making it difficult to assess the impact of pathway participation on postsecondary outcomes. Consortia partners should focus on making sure these data are accessible to researchers and encourage Cal-PASS Plus to capture student enrollment in the various specialized programs such as pathways offered by California high schools.

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The regional strategy holds great promise to deepen the infrastructure supporting work-based learning and to improve collaboration between secondary and postsecondary education, advancing two areas that have been underdeveloped in the California Linked Learning District Initiative. Despite the promise of the regional expansion for supporting systems and building partnerships, much work remains to change day-to-day instruction in Linked Learning classrooms. A fundamental transformation of teaching and learning requires ongoing coaching and job-embedded support for pathway teachers. The initiative districts are making some movement in this area with the hiring of dedicated internal coaches who are charged with supporting pathway teams with curriculum, instruction, and assessment. As Linked Learning continues to expand, stakeholders will need to continue focusing on high-quality teaching and learning. Without this focus, Linked Learning is unlikely to affect student learning in a meaningful way.

References

Belfield, C. R., & Crosta, P. M. (2012, February). *Predicting success in college: The importance of placement tests and high school transcripts*. CCRC Working Paper No. 42. New York, NY: Community College Research Center, Teachers College, Columbia University.

Berger, A., Turk-Bicakci, L., Garet, M., Song, M., Knudson, J., Haxton, C., Zeiser, K., Hoshen, G., Ford, J., Stephan, J., Keating, K., & Cassidy, L. (2013). *Early college, early success: Early College High School Initiative Impact Study*. Washington, DC: American Institutes for Research. Retrieved from http://www.air.org/files/ECHSI_Impact_Study_Report_Final1.pdf

Bureau of Labor Statistics. (2015). Labor force statistics from the current population survey. Retrieved from: http://www.bls.gov/web/empsit/cpsee_e16.htm

Booker, K., Zimmer, R., & Buddin, R. (2005). *The effects of charter schools on school peer composition*. Santa Monica, CA: RAND Corporation. www.rand.org/pubs/working_papers/WR306California

California Department of Education. (2014). California high school career technical education courses meeting University of California "a–g" admission requirements for 2013–14. Retrieved from http://www.ucop.edu/agguide/career-technical-education/trends/index.html

California Department of Education. (n.d.). DataQuest. Retrieved from: http://data1.cde.ca.gov/dataquest/

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2013). *Racial and economic diversity in North Carolina's schools: An update*. Durham, NC: Duke Sanford School of Public Policy.

Community Colleges Chancellor's Office. (2014). *Minimum qualifications for faculty and administrators in California community colleges*. Retrieved from: http://californiacommunitycolleges.cccco.edu/Portals/0/FlipBooks/2014_MQHandbook/2014_MQHandbook_ADA.pdf

ConnectEd: The California Center for College and Career. (n.d.). Linked Learning essential elements for pathway quality. Retrieved from http://www.connectedcalifornia.org/direct/files/Essential Elements for Pathway Quality_Descriptors(2).pdf

ConnectEd: The California Center for College and Career. (2012). *Rubric for Linked Learning pathway quality review and continuous improvement*. Berkeley, CA: Author.

ConnectEd: The California Center for College and Career. (2014a). *Framework for developing a system of Linked Learning pathways*. Berkeley, CA: Author.

ConnectEd: The California Center for College and Career. (2014b). Advanced Pathway Performance Assessment System (APPA) project overview. Berkeley, CA: Author.

Education Week Research Center. (2015). *Social emotional learning: Perspectives from America's schools*. Bethesda, MD: Editorial Projects in Education Inc.

Elmore, R. (2000). *Building a new structure for school leadership*. Washington, DC: The Albert Shanker Institute.

Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching adolescents to become learners: The role of noncognitive factors in shaping school performance: A critical literature review*. IL: University of Chicago Consortium on Chicago School Research.

Fowler, W. J., Jr., & Walberg, H. J. (1991). School size, characteristics, and outcomes. *Educational Evaluation and Policy Analysis*, *13*(2), 189–202.

Frankenberg, E., Siegel-Hawley, G., & Wang, J. (2011). Choice without equity: Charter school segregation. *Education Policy Analysis Archives*, *19*(1). http://epaa.asu.edu/ojs/article/view/779

Gronn., P. (2002). Distributed leadership. In K. Leithwood & P. Hallinger (Eds.), *Second international handbook of educational leadership and administration* (pp. 653–696). London: Kluwer Academic.

Guha, R., Adelman, N., Arshan, N., Bland, J., Caspary, K., Padilla, C., Patel, D., Tse, V., Black, A., & Biscocho, F. (2014). *Taking stock of the California Linked Learning District Initiative*. Fourth-year evaluation report. Menlo Park, CA: SRI International.

Howley, C. & Howley, A. (2004). School size and the influence of socioeconomic status on student achievement: Confronting the threat of size bias in national data sets. *Education Policy Analysis Archives*, *12*(52).

Hughes, K. L., Rodriquez, O., Edwards, L., & Belfield, C. (2012). *Broadening the benefits of dual enrollment: Reaching underachieving and underrepresented students with career-focused programs*. New York, NY: Community College Research Center, Teachers College, Columbia University.

Jobs for the Future. (2015). Building a work-based learning intermediary handout.

Lee, V. E., Croninger, R. G., & Smith, J. B. (1997). Course-taking, equity, and mathematics learning: Testing the constrained curriculum hypothesis in U.S. secondary schools. *Educational Evaluation and Policy Analysis,* 19(2), 99–121.

Lee, V. E. & Ready, D. D. (2007a). *Schools-within-schools: Possibilities and pitfalls of high school reform*. New York: Teachers College Press.

Lee, V. E. & Ready, D. D. (2007b). Optimal context size in elementary schools: Disentangling the effects of class size and school size. In T. Loveless & F. M. Hess (Eds.), *Brookings papers on education policy*, *2006/2007* (pp. 99–135). Washington, DC: Brookings Institution Press.

Lee, V. E., & Smith, J. (1997). High school size: Which works best and for whom? *Educational Evaluation and Policy Analysis*, *19*(3), 205–227.

Leithwood, K., Seashore Louis, K, Anderson, S, & Wahlstrom, K. (2004). *How leadership influences student learning*. Retrieved from http://www.wallacefoundation.org/knowledge-center/school-leadership/key-research/Documents/How-Leadership-Influences-Student-Learning.pdf

Makris, M. (2015). Public housing and school choice in a gentrified city: Youth experiences of uneven opportunity. *Palgrave Studies in Urban Education.* Retrieved from http://www.palgrave.com/page/detail/public-housing-and-school-choice-in-a-gentrified-city-molly-vollman-makris/?isb=9781137429155

McMillen, B. J. (2004). School size, achievement and achievement gaps. *Education Policy Analysis Archives*, *12*(58).

National Center for Education Statistics. (2015). *Public high school graduation rates*. Retrieved from: http://nces.ed.gov/programs/coe/indicator_coi.asp

Nathanson, L., Corcoran, S., & Baker-Smith, C. (2013). *High school choice in New York City: A report on the school choices and placements of low-achieving students*. New York, NY: Research Alliance for New York City Schools. http://steinhardt.nyu.edu/research_alliance/publications/hs_choice_low_achieving_students

Parks, S., Hironaka, S., Carver, P., & Nordstrum, L. (2013). *Continuous improvement in education*. Stanford, CA: Carnegie Foundation for the Advancement of Teaching.

Powell, F. C., Farrar, E., & Cohen, D. K. (1985). *The shopping mall high school: Winners and losers in the educational marketplac*e. Boston, MA: Houghton Mifflin

Saparito, S., & Lareau, A. (1999). School selection as a process: The multiple dimensions of race in framing educational choice. *Social Problems.* Retrieved from http://socpro.oxfordjournals.org/content/46/3/418.article-info

School Redesign Network at Stanford University. (2010). *Distributive leadership in district reform: A model for taking Linked Learning to scale*. Retrieved from http://connectedcalifornia.org/downloads/Distributive_Leadership_Knowledge_Brief.pdf

Spillane, J., Halverson, R., & Diamond, J. (2000). *Toward a theory of leadership practice: A distributed perspective*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Struhl. B., & Vargas, J. (2012, October). *Taking college courses in high school: A strategy for college readiness*. Boston, MA: Jobs for the Future. Retrieved from http://www.jff.org/sites/default/files/publications/TakingCollegeCourses_101712.pdf

U.S. Census Bureau (2009). Survey of Income and Program Participation, 2008 Panel. Retrieved from: https://www.census.gov/hhes/socdemo/education/data/sipp/2009/tables.html

U.S. Department of Education, Institute of Education Sciences. (2013, March). *What Works Clearinghouse: Procedures and standards handbook* (Version 3.0). Retrieved from http://whatworks.ed.gov

Warren, P., & Hough, H. (2013). *Increasing the usefulness of California's education data*. Public Policy Institute of California. Retrieved from: http://www.ppic.org/content/pubs/report/R_813PWR.pdf

Weiher, G. R., & Tedin, K. L. (2002). Does choice lead to racially distinctive schools? Charter schools and household preferences. *Journal of Policy Analysis and Management, 21*, 79–92. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/pam.1041/abstract

Will, M. (2014). Average urban school superintendent tenure decreases, survey shows. *Education Week.* Retrieved from http://blogs.edweek.org/edweek/District_Dossier/2014/11/urban_school_superintendent_te.html(ch.3)

Appendix: Research Methods

The Center for Education Policy at SRI International was contracted by The James Irvine Foundation to evaluate the Linked Learning District Initiative. In this multiyear study, SRI has examined district-level implementation of the Linked Learning system and assessed student outcomes associated with district participation in the initiative. SRI has used a multimethod research design that includes qualitative and quantitative data collection and analysis. Described here are the data collection methods and analytic approach.

Qualitative Data Collection and Analysis

To understand the progression of the Linked Learning District Initiative and to gather information on students' experiences in career pathways, SRI researchers conducted a range of qualitative data collection activities in all nine districts that received implementation grants from ConnectEd in 2009 or 2010. The qualitative data collection consisted of observations of ConnectEd events that district and pathway staff attended; reviews of district documents and news stories, as available; telephone interviews; and district site visits that included interviews and student focus groups.

Observations of ConnectEd- and Linked Learning Alliance-hosted events: SRI research team members attended selected ConnectEd- and Linked Learning Alliance-hosted events that district teams also attended. These were the January 2015 Linked Learning Convention, the April 2015 Linked Learning Alliance Policy Convening, and the June 2015 ConnectEd District Leadership Institute for Work-Based Learning. Researchers took notes on these meetings and talked informally with district and pathway staff.

Document and news review: The research team examined available district Linked Learning documents and monitored local news for stories to support understanding of state and district contexts.

Phone interviews and site visits: The research team conducted individual interviews in fall 2014 and spring 2015 to follow district implementation in all nine districts. The interview topics were leadership and management for the initiative; pathway expansion and sustainability; pathway quality and the use of integrated projects and performance-based assessments; student access to pathways; continuation of district systems to support pathways; impact of regional funding on the initiative; the role of local and regional partnerships; the impact of regional scaling on work-based learning and coaching; technical assistance; and supports for students' transition to postsecondary opportunities. The student focus group protocols addressed students' experience with the key components of Linked Learning and their perceptions of how these experiences have shaped their readiness for college and career. We developed semistructured interview protocols covering these topics or a subset of these topics for key respondent categories (e.g., Linked Learning director, pathway lead). We tailored the protocols to each respondent's role type and experience with Linked Learning. Interviewers took notes and audio-recorded interviews for use during analysis.

In fall 2014, SRI research team members interviewed Linked Learning directors in all nine districts by phone. In spring 2015, we conducted site visits to the nine districts. During these visits, we interviewed Linked Learning directors, external district and pathway coaches from ConnectEd or other organizations, other partners, and district personnel who could speak to Linked Learning implementation. We primarily interviewed district staff involved in work-based learning and pathway curriculum and instruction. In consultation with the Linked Learning director from each district, we selected up to three pathways to visit with a focus on pathways nearing certification or recertification at the time of our site visit or pathways involved in the new work-based learning or regional grant activities. A team of two or three researchers visited each of these pathways. For each pathway we targeted pathway leaders, typically the pathway lead, and sometimes additional staff such as school-level work-based learning coordinators or the principal in a small school. We also conducted a focus group with students in each pathway (the majority 12th-graders), for a total of 26 student focus groups across the nine districts.

To provide context for interpreting postsecondary student outcomes, we also conducted site visits to a sample of four local community colleges that enrolled Linked Learning graduates. The purpose was to better understand Linked Learning graduates' transition between high school and postsecondary education and their early college experiences. As part of our site visits, we interviewed a selected group of postsecondary staff including student support personnel and administrative staff. We also conducted student focus groups with Linked Learning graduates in their first year of college. Interview and focus group topics concerned students' transition from high school to postsecondary and first-year college experiences, including their college readiness experiences and preparation in high school (e.g., dual-enrollment opportunities, support with college applications), college outreach activities for high school students (e.g., awareness activities on behalf of the college), placement assessment (i.e., need for academic remediation), transitional supports for first-year college students (e.g., summer bridge programs), academic counseling/advisement, available ongoing student supports, and barriers and challenges to student success.

In total, SRI researchers interviewed 106 individuals, conducted 26 high school student focus groups that ranged from three to nine students, and spoke with 16 college students in the spring 2015 data collection. Exhibit A-1 contains more detailed information about the spring interviews.

Exhibit A-1
Number of Interview and Focus Group Respondents by Type, Spring 2015

Respondent Type	Number
District staff	44
Other partners	2
External coaches	10
School administrators and other staff	7
Pathway leads	32
High school students	171
Postsecondary staff	10
Postsecondary students	16
Total	292

Each site visit team completed a structured debriefing guide aligned with the study's research questions. During and after the period when interviews were conducted, the entire research team assembled to compare, contrast, and synthesize findings across interviewees; to identify overarching themes and initial hypotheses; to determine how these findings related to the quantitative data; and to refine analyses and assertions before writing this report.

Extant Data Collection and Analysis

SRI obtained extant data for all nine districts in the Linked Learning District Initiative. Researchers used these data for two purposes: (1) to examine equitable access to and persistence in pathways and (2) to estimate the impact of pathways on student-level indicators of college readiness. In this section, we provide detail to support the access and equity analysis presented in Chapter 5 and the college-ready graduates outcomes analysis presented in Chapter 6. We first describe the data sources and elements used in both analyses and provide general background information on the pathways and districts. Next, we describe the sampling, variables, and analytic approach to support the access and equity and the college-ready graduate analyses. For the college-ready graduates analysis, we provide the results for all students and our subgroups of interest in both certified and non-certified pathways.

Context and Data Sources

The research team received student-level demographic, standardized test performance, graduation, course outcomes, high school program enrollment, and postsecondary enrollment data from a third party, the Institute for Evidence-Based Change. The research team requested 7th- through 12th-grade data for the class of 2013 (students who started ninth grade in the 2009–10 school year) in Antioch, Long Beach, Pasadena, and Porterville and 7th- through 11th- or 12th-grade data for the classes of 2014 and 2015 (students who began high school in 2010–11 and 2011–12, respectively) in all nine districts. In Los Angeles, the analytic sample included the high schools that were originally in Local District 4 and ended up in the innovation subdistrict after district reorganization.

Pathway and District Context

Each of the Linked Learning districts provides students with a variety of academic options for school and pathway enrollment, including certified pathways, non-certified pathways, traditional high schools, alternative schools, and charter schools.

To describe various academic options, we classified all high school programs in each district into one of the following program types:

- **Certified pathways**—Because pathways develop over time, we considered a student to be enrolled in a certified pathway if the pathway was certified before the end of that student's 10th-grade year. This classification means students enrolled in the same pathway in different cohorts may be considered to be enrolled in different pathway types. We considered pathways to be certified based on Linked Learning's classification and thus included those certified by the National Academy Foundation (NAF) in the 2012–13 school year.[38] Exhibit A-2 shows the certified pathways in each district.
- **Non-certified pathways**—We considered any program that districts flagged as a pathway without the certified classification to be a non-certified pathway. These programs typically shared some important features with the certified pathways (e.g., small cohort, career theme) but varied in how closely they aligned with or aimed to replicate the full Linked Learning approach. This category included pathways deemed in progress toward certification.
- **Alternative and continuation schools**—We classified schools for struggling students (e.g., credit recovery programs) or students with special needs (e.g., special education) into one group. For the access and equity analyses, we included these students in the overall district category. We excluded such alternative and continuation schools from our analysis of college-ready high school graduates.

[38] The 2012–13 school year was the first year in which ConnectEd accepted NAF certification in lieu of ConnectEd's certification process. This year corresponds with the year the class of 2015 (our final cohort) was enrolled in the 10th grade, making it the last year during which certification affected the classification of any students in our sample.

- **Nonpathway at wall-to-wall schools**—Several districts have at least one high school where all students should be assigned a pathway designation (these schools are commonly referred to as "wall-to-wall schools"), but not all the students in the school had a flag identifying their pathway. We designated any students at these wall-to-wall schools without a pathway flag as "nonpathway at wall-to-wall schools." For the access and equity analyses, we included these students in the overall district category. We excluded these students from our analysis of college-ready high school graduates.
- **Schools outside district control**—We excluded any schools deemed out of district control (e.g., home school programs, independent charter schools) from all analyses.[39]
- **Traditional high school:** We classified all other academic programs as "traditional high school" programs. This group serves as our primary reference group in our analysis of college-ready high school graduates.

We assigned students to a particular pathway or school based on their 9th- or 10th-grade enrollment, depending on the lowest grade level served by certified pathways in the district. In Antioch, Los Angeles, Montebello, Sacramento, and Porterville, certified pathways began in ninth grade. In Oakland and West Contra Costa, pathways began in 10th grade. Several Long Beach and Pasadena pathways began in the 10th grade, and a single pathway began in 10th grade in Montebello and Pasadena.[40] Montebello chose not to send any pathways through the certification process and therefore does not contain any certified pathways.

Exhibit A-2 lists all certified pathways included in the analysis by district. The column "First Cohort Certified" lists the first class of students for whom we classified the pathway as certified. We consider this class and all subsequent classes as having attended a certified pathway in the outcomes analysis.

[39] Some charter schools (e.g., New Technology High, The Met High in Sacramento) were created by district school boards and are considered dependent charter schools. These schools are included in all analyses.

[40] In Long Beach during the years these data capture, two high schools enrolled the majority of students in freshman academies, intentionally giving them a year of high school before choosing a pathway. We assigned students from these two high schools who began a pathway in their 10th-grade year into their 10th-grade pathway.

Exhibit A-2
Certified Pathways Included in Analysis, by District

District	High School (HS)	Certified Pathway	First Cohort Certified
Antioch			
	Dozier-Libbey Medical HS	Health Science and Medical Technology	Class of 2013
	Deer Valley HS	Law and Justice	Class of 2015
	Antioch HS	Engineering and Designing Green Environments (EDGE)	Class of 2015
Long Beach			
	California Academy of Math and Science	Engineering and BioScience	Class of 2013
	Jordan HS	Architecture, Construction, and Engineering Academy (ACE)	Class of 2013
	Jordan HS	Jordan Media and Communications (JMAC)	Class of 2015
	Millikan HS	Community of Musicians, Performers, Artists, and Social Scientists (COMPASS)	Class of 2013
	Millikan HS	PEACE Academy	Class of 2013
Los Angeles			
	Robert F. Kennedy Community Schools Complex	Los Angeles High School for the Arts (LAHSA)	Class of 2014
	Miguel Contreras Learning Complex	Los Angeles School of Global Studies	Class of 2014
Oakland			
	LIFE Academy	Life Academy of Health and Bioscience	Class of 2014
	Media College Preparatory	Media Academy	Class of 2014
	Skyline HS	Education Academy	Class of 2014
Pasadena			
	John Muir HS	Arts, Entertainment, and Media[a]	Class of 2013
	John Muir HS	Business and Entrepreneurship Academy	Class of 2013
	John Muir HS	Engineering and Environmental Science Academy	Class of 2015
	Pasadena HS	Creative Arts, Media, and Design Academy	Class of 2013
Porterville			
	Granite Hills HS	Digital Communication and Design	Class of 2015
	Harmony Magnet	Engineering Academy[b]	Class of 2013
	Harmony Magnet	Performing Arts Academy[b]	Class of 2014
	Monache HS	Multimedia Technology Academy	Class of 2014
	Porterville HS	Partnership Academy of Business	Class of 2013
	Porterville HS	Partnership Academy of Health Sciences	Class of 2014
Sacramento			
	A. A. Benjamin Health Professions HS	Health Professions	Class of 2014
	Hiram W. Johnson HS	Business Corporate Academy	Class of 2015
	New Technology HS	School of Design	Class of 2014
	School of Engineering and Sciences	Engineering and Science	Class of 2015
	The MET	Learning Through Internship	Class of 2015

Exhibit A-2
Certified Pathways Included in Analysis, by District (concluded)

District	High School	Certified Pathway	First Cohort Certified
West Contra Costa			
	Richmond HS	Engineering Academy	Class of 2014
	Richmond HS	Law Academy	Class of 2014
	Richmond HS	Multimedia Academy	Class of 2014
	De Anza HS	Health Academy	Class of 2015

[a] Includes students enrolled in the Graphic Communications pathway.

[b] Pathway flags were unavailable for Harmony Magnet for the 2010–11 and 2011–12 school year. Both pathways are modeled jointly in these two school years.

Data Elements

Exhibit A-3 lists all the variables included in the analyses reported in Chapters 5 and 6, including descriptions of how each variable was calculated. Variables that are used only in the analysis of college-ready graduates—related to student achievement and high school outcomes data—are provided in Exhibit A-10 in the "Choosing and Defining Outcomes" section.

Exhibit A-3
Data Elements for Access and Equity and College-Ready Graduates Analyses

Variable	Description
Student Demographics	
Female	Equal to 1 if student was female; equal to 0 if student was male.
Low socioeconomic status (SES)	Equal to 1 if student was part of the National School Lunch Program or parents' education level was not higher than high school graduate; equal to 0 if student was not part of the National School Lunch Program and parents' education level was higher than a high school graduate and the value was nonmissing.
White	Equal to 1 if student was white, non-Latino; equal to 0 if student was not white and the value was nonmissing.
Latino	Equal to 1 if student was Latino; equal to 0 if student was not Latino and the value was nonmissing.
African American	Equal to 1 if student was African American, non-Latino; equal to 0 if student was not African American and the value was nonmissing.
Asian	Equal to 1 if student was Asian, non-Latino; equal to 0 if student was not Asian and the value was nonmissing.
Other race/ethnicity	Equal to 1 if student was American Indian, Alaskan Native, or ethnicity unknown; equal to 0 if student's ethnicity was known and was not American Indian or Alaskan Native.
Low prior achievement	Equal to 1 if student scored below basic or far below basic on the English Language Arts (ELA) California Standards Test (CST) before start of pathway or traditional high school program; equal to 0 if student scored basic or higher.
Gifted and talented	Equal to 1 if student was gifted and talented; equal to 0 if student was not gifted and talented and the value was nonmissing.
Special education	Equal to 1 if student was in special education; equal to 0 if the student was not in special education and the value was nonmissing.
English learner	Equal to 1 if student was classified as an English learner; equal to 0 if student was not classified as an English learner and the value was nonmissing.
Redesignated fluent English proficient	Equal to 1 if student was reclassified as proficient in English; equal to 0 if student was not classified as reclassified as proficient in English and the value was nonmissing.
Initially fluent English proficient	Equal to 1 if student had a home language other than English, but who was initially classified as proficient in English; equal to 0 if student was not initially classified as proficient in English and the value was nonmissing.
English only	Equal to 1 if student had English as only home language; equal to 0 if student did not have English as only home language and the value was nonmissing.

Exhibit A-3
Data Elements for Access and Equity and College-Ready Graduates Analyses (concluded)

Student Cohort Variables	
Class of 2013	A student in the 9th grade in the 2009–10 school year (class of 2013 if graduates on time)
Class of 2014	A student in the 9th grade in the 2010–11 school year (class of 2014 if graduates on time)
Class of 2015	A student in the 9th grade in the 2011–12 school year (class of 2015 if graduates on time)
Pathway started in 10th grade	Equal to 1 if student's pathway or traditional high school program started in 10th grade; equal to 0 if student's pathway or traditional high school program started in 9th grade.

Access and Equity Analysis Methods

In Chapter 5 we present the results of two descriptive analyses to identify patterns in students' entry into and persistence in pathways. Below, we describe the sample and analytic approach for each of these analyses.

Pathway Enrollment

The pathway enrollment analysis explored differences in students' entry into pathways based on student demographic characteristics and prior achievement. The analytic sample included students enrolled in the following types of high school programs (as defined above): certified pathways, non-certified pathways, traditional high schools, alternative or continuation schools, and nonpathway students at wall-to-wall high schools.[41]

In Chapter 5, we present the rate of enrollment of subgroup students (i.e. special education, English learner, and low prior achievement) in certified and non-certified pathways compared with the percentage of that subgroup in the district population. These results are displayed in Exhibit 5-2. Exhibit A-4 provides the numbers of students enrolled in pathways by subgroup used to calculate the percentages in Exhibit 5-2. Each "District Total" row presents all nonmissing values of students in certified pathways, non-certified pathways, and the district overall (including students in traditional high schools, alternative/continuation schools, and nonpathway students at wall-to-wall high schools). For example, in Antioch special education students made up 13% of the overall population (591 out of 4,683 students) but only 7% of the students in certified pathways (53 out of 745).

[41] The analytic sample for the access and equity analyses differed from the college-ready graduates outcome analysis described below. The access and equity analysis included students from a broader range of high school programs, students who were missing prior achievement data used in the outcomes analysis, and students in pathways with less than 20 students. These students were excluded from the outcomes analysis.

Exhibit A-4
Enrollment of Special Student Populations, by District

	Special Education			English Learners			Low Prior Achievement[a]		
	Certified Pathways	Non-certified Pathways	District Overall	Certified Pathways	Non-certified Pathways	District Overall	Certified Pathways	Non-certified Pathways	District Overall
Antioch									
N in subgroup	53	34	591	67	13	485	89	47	1,043
District total	745	412	4,683	745	412	4,682	745	412	4,014
Long Beach									
N in subgroup	45	875	1,786	106	2,381	3,755	86	2,516	3,907
District total	1,880	12,885	20,092	1,880	12,885	20,091	1,880	12,885	17,870
Los Angeles									
N in subgroup	11	395	514	177	1,941	2,751	122	1,560	2,139
District total	414	5,152	6,925	412	5,139	6,900	376	4,431	5,948
Montebello									
N in subgroup	0	30	489	0	76	1,209	0	59	1,058
District total	0	442	5,014	0	442	5,011	0	442	4,384
Oakland									
N in subgroup	42	152	560	144	327	1,185	154	389	1,450
District total	403	1,685	4,636	403	1,685	4,636	403	1,685	4,121
Pasadena									
N in subgroup	106	31	434	186	49	639	277	88	928
District total	1,047	324	4,145	1,047	324	4,144	1,047	324	3,631
Porterville									
N in subgroup	8	13	205	86	70	840	26	32	459
District total	862	479	4,621	862	479	4,621	862	479	2,199
Sacramento									
N in subgroup	52	71	621	108	191	1,252	94	151	1,087
District total	529	896	5,976	529	896	5,976	529	896	5,064
West Contra Costa									
N in subgroup	55	128	478	246	365	999	217	419	1,161
District total	509	1,422	3,846	509	1,422	3,845	509	1,422	3,525

Note: Initial enrollment data presented above will not perfectly align with initial enrollment results in Exhibits A-5 through A-9 showing pathway persistence through grade 11 because of students whose 11th-grade status was uncertain in the data.

*N*s vary within districts for different subgroups because of missing data. Across all districts, district data were missing special education status for 171 students (0.28% of observations), English learner status for 203 students (0.34% of observations), and prior achievement scores needed to derive the low prior achievement indicator for 9,353 students (15.6% of observations). Montebello had no certified pathways during the study period.

[a] Low prior achievement is defined as scoring below basic on the English Language Arts California Standards Test (ELA CST).

Persistence Within Pathways

A second analysis in Chapter 5 explored the extent to which students who initially enrolled in certified and non-certified pathways remained in the same pathway through the beginning of 11th grade. The analytic sample for the persistence analysis included the same high school programs as the enrollment sample. Because we had only 12th-grade data for the classes of 2013 and 2014, we chose to focus on persistence to the beginning of 11th grade, enabling us to include all three cohorts.

We classified students who initially enrolled in certified or non-certified pathways in 9th or 10th grade into four persistence categories based on their enrollment at the beginning of 11th grade. These categories are

- **No longer in the district:** Students were considered present in the district if they had a nonmissing value for 11th-grade ELA CST, 11th-grade GPA, or 11th-grade school or pathway enrollment.
- **No longer in a pathway, but in the same district:** The student remained in the district but moved to a traditional high school or other nonpathway high school program.
- **In a different pathway:** The student remained in the district, but moved to a different pathway (either certified or non-certified).
- **In same pathway:** The student remained in the district from 9th to 11th grade and in the same pathway in which he/she initially enrolled.

In Exhibit 5-3, we present the percentage of certified and non-certified pathway students, overall and by three subgroups (special education, English learner, and low prior achievement), that fell into the persistence categories defined above. Exhibit A-5 presents the number of students across districts who persisted through 11th grade, overall among those who initially enrolled in pathways, and by subgroup. To calculate the percentage of students in a given persistence category within each row of certified or non-certified pathway students, divide the number of students in that persistence category by the initial enrollment. For example, 4,453 of 6,225 students who initially enrolled in certified pathways remained in this pathway through the beginning of 11th grade (72% of these students).

Exhibit A-5
Persistence to the 11th Grade Overall and by Subgroup

	Initial Enrollment	No Longer in the District	No Longer in a Pathway But in the Same District	In a Different Pathway	In Same Pathway
	N	*N*	*N*	*N*	*N*
Overall					
Certified	6,165	567	727	318	4,553
Non-certified	22,204	3,280	2,954	1,830	14,140
Special education					
Certified	348	39	57	15	237
Non-certified	1,559	227	292	157	883
English learners					
Certified	1,052	130	155	61	706
Non-certified	4,917	939	875	435	2,668
Low prior achievement[a]					
Certified	982	116	203	47	616
Non-certified	4,677	909	958	427	2,383

Note: Montebello had no certified pathways during the study period.

Some pathway students are captured in multiple subgroup rows (e.g., a student can be an English learner and designated special education), and some pathway students were not in any of the listed subgroups, so the subgroup rows will not sum to the "Overall" rows at the top.

[a] Low prior achievement is defined as scoring below basic on the ELA CST.

In our Chapter 5 analysis of student persistence in certified and non-certified pathways, we discussed student persistence within individual districts. Exhibit A-6 presents the number of students in each district who persisted through 11th grade after initial pathway enrollment. To calculate the percentage of students in a given persistence category within each row of certified or non-certified pathway students, divide the number of students in that persistence category by the initial enrollment. For example, In Antioch, 63 of 734 students who initially enrolled in certified pathways were no longer in the district by the beginning of 11th grade (9% of these students).

Exhibit A-7 presents the number of special education students across districts who persisted through 11th grade from certified pathways and non-certified pathways. Exhibits A-8 and A-9 present within-district persistence numbers for English learners and students with low prior achievement.

Exhibit A-6
Persistence to the 11th Grade, by District

	Initial Enrollment	No Longer in the District	No Longer in a Pathway But in the Same District	In a Different Pathway	In Same Pathway
	N	*N*	*N*	*N*	*N*
Antioch					
Certified	734	63	117	7	547
Non-certified	394	38	93	33	230
Long Beach					
Certified	1,848	103	59	41	1,645
Non-certified	12,158	1,394	1,350	1,021	8,393
Los Angeles					
Certified	397	65	7	22	303
Non-certified	4,729	1,477	250	517	2,485
Montebello					
Non-certified	429	13	81	0	335
Oakland					
Certified	377	21	55	8	293
Non-certified	1,530	35	352	124	1,019
Pasadena					
Certified	985	161	200	25	599
Non-certified	304	41	96	16	151
Porterville					
Certified	835	41	132	137	525
Non-certified	452	31	89	33	299
Sacramento					
Certified	512	90	111	57	254
Non-certified	851	155	419	35	242
West Contra Costa					
Certified	477	23	46	21	387
Non-certified	1,357	96	224	51	986

Note: Montebello had no certified pathways during the study period.

Exhibit A-7
Special Education Students' Persistence to the 11th Grade, by District

	Initial Enrollment	No Longer in the District	No Longer in a Pathway But in the Same District	In a Different Pathway	In Same Pathway
	N	*N*	*N*	*N*	*N*
Antioch					
Certified	52	4	9	0	39
Non-certified	30	4	8	0	18
Long Beach					
Certified	44	5	2	0	37
Non-certified	802	86	151	106	459
Los Angeles					
Certified	9	1	1	0	7
Non-certified	344	108	24	31	181
Montebello					
Non-certified	30	1	3	0	26
Oakland					
Certified	36	1	5	2	28
Non-certified	134	2	45	8	79
Pasadena					
Certified	100	19	13	6	62
Non-certified	29	1	8	3	17
Porterville					
Certified	8	0	3	0	5
Non-certified	13	1	4	0	8
Sacramento					
Certified	50	8	16	7	19
Non-certified	63	14	28	2	19
West Contra Costa					
Certified	49	1	8	0	40
Non-certified	114	10	21	7	76

Note: Montebello had no certified pathways during the study period.

Exhibit A-8
English Learners' Persistence to the 11th Grade, by District

	Initial Enrollment	No Longer in the District	No Longer in a Pathway But in the Same District	In a Different Pathway	In Same Pathway
	N	*N*	*N*	*N*	*N*
Antioch					
Certified	65	9	11	1	44
Non-certified	13	1	4	0	8
Long Beach					
Certified	106	10	7	3	86
Non-certified	2,200	239	469	214	1,278
Los Angeles					
Certified	163	28	3	12	120
Non-certified	1,716	619	106	154	837
Montebello					
Non-certified	72	2	8	0	62
Oakland					
Certified	133	13	16	3	101
Non-certified	287	7	85	42	153
Pasadena					
Certified	170	36	45	2	87
Non-certified	44	9	14	3	18
Porterville					
Certified	82	4	19	16	43
Non-certified	64	8	15	3	38
Sacramento					
Certified	104	18	26	13	47
Non-certified	178	32	114	8	24
West Contra Costa					
Certified	229	12	28	11	178
Non-certified	343	22	60	11	250

Note: Montebello had no certified pathways during the study period.

Exhibit A-9
Low Prior Achievement Students' Persistence to the 11th Grade, by District

	Initial Enrollment	No Longer in the District	No Longer in a Pathway But in the Same District	In a Different Pathway	In Same Pathway
	N	*N*	*N*	*N*	*N*
Antioch					
Certified	87	13	30	0	44
Non-certified	42	5	13	5	19
Long Beach					
Certified	84	3	9	4	68
Non-certified	2,300	313	536	216	1,235
Los Angeles					
Certified	108	21	0	10	77
Non-certified	1,315	495	83	130	607
Montebello					
Non-certified	55	3	11	0	41
Oakland					
Certified	141	9	30	6	96
Non-certified	330	15	115	48	152
Pasadena					
Certified	257	39	71	8	139
Non-certified	82	8	30	7	37
Porterville					
Certified	24	2	11	1	10
Non-certified	25	3	10	0	12
Sacramento					
Certified	88	19	22	9	38
Non-certified	143	31	85	5	22
West Contra Costa					
Certified	193	10	30	9	144
Non-certified	385	36	75	16	258

Note: Montebello had no certified pathways during the study period.

College-Ready Graduates Analysis Methods

In Chapter 6, we analyze the high school outcomes of students in certified and non-certified pathways compared with peers with similar demographic characteristics and prior achievement in traditional high school programs. In this section of the appendix, we provide context to the results and implications presented in the full report. We describe how we determined the analytic sample for our analysis of college-ready graduates, including how the data available to us affected which outcomes we analyzed for students in each cohort and district. We then provide descriptive information on the student demographic, achievement, and outcome variables that were part of our high school outcomes analysis. Last, we detail the analysis methods and provide complete results for all students and those in our subgroups of interest in both certified and non-certified pathways.

Choosing and Defining Outcomes

In this report, we focused on cumulative indicators of high school success and college readiness: credit accumulation, college-admission GPA, completion of college-preparatory requirements, performance on the ELA EAP exam, and graduation. We also examined dropout. Given that we have access only to data through the 11th grade for the class of 2015, this cohort was included only in the GPA and ELA EAP analyses, which did not draw on 12th-grade data.

Relative to last year's report, we eliminated two outcomes—absences and course failures—which we had found to be uninformative. In the fifth year of the evaluation, we found no statistically significant differences between certified pathway students and similar peers in traditional high school programs for either outcome, most likely in part because of the lack of variation in these outcome variables. This year we also constructed some outcomes differently than we did in the past. This year, we analyzed high school dropout instead of retention in a district because we received student exit data from all nine districts for the first time, which enabled us to determine whether a student transferred out of the district or left for another reason besides dropping out. Also, to focus on cumulative high school outcomes,[42] we calculated completion of college-preparatory course requirements and credits accumulated aggregated over the course of students' pathway or traditional high school program instead of separately for each grade level.[43]

Exhibit A-3 presents each data element used in Chapters 5 and 6. Exhibit A-10 details the additional data elements used in the high school outcomes analysis.

[42] For the first time, in this year's report, we are able to provide 12th-grade outcomes for students in all nine districts. In previous years, we looked at student outcomes for each grade level of high school, but this year, with 12th-grade outcomes from all districts, we move to a more longitudinal lens and examine cumulative high school outcomes to provide an overview of the impact the Linked Learning approach has on students throughout their high school careers.

[43] For pathways that began in the ninth grade, we calculated cumulative high school outcomes on the basis of students' 9th- through 12th-grade years. For pathways that began in the 10th grade, we calculated cumulative high school outcomes on the basis of students' 10th- through 12th-grade years, except for completion of coursework required for admittance to a 4-year university. Because completion of coursework required for admittance to a 4-year university necessitates 4 years of academic coursework, this variable was calculated on the basis of students' 9th- through 12th-grade years for all students regardless of the year in which the pathway began.

Exhibit A-10

Data Elements for High School Outcomes Analysis

Variable	Description
Student Achievement	
ELA CST	ELA CST score taken before start of pathway or traditional high school program.
Timing of ELA CST	Equal to 1 if student had nonmissing value on ELA CST 2 years before start of pathway or traditional high school program and had missing value on ELA CST 1 year before start of pathway or traditional high school program; equal to 0 if student had nonmissing value on ELA CST 1 year before start of pathway or traditional high school program or had missing values on ELA CST 1 and 2 years before start of pathway or traditional high school program.
Math CST	Math CST score taken before start of pathway or traditional high school program.
Timing of Math CST	Equal to 1 if student had nonmissing value on math CST 2 years before start of pathway or traditional high school program and had missing value on math CST 1 year before start of pathway or traditional high school program; equal to 0 if student had nonmissing value on math CST 1 year before start of pathway or traditional high school program or had missing values on math CST 1 and 2 years before start of pathway or traditional high school program.
Math CST: Grade-Level Math	Equal to 1 if student took the 7th-grade-level math CST test before start of pathway or traditional high school program; equal to 0 if student did not take 7th-grade-level math CST test and the value was nonmissing.
Math CST: General Math	Equal to 1 if student took the 8th- or 9th-grade general math CST test; equal to 0 if student did not take 8th- or 9th-grade general math CST test and the value was nonmissing.
Math CST: Algebra I	Equal to 1 if student took the Algebra I CST test; equal to 0 if student did not take Algebra I CST test and the value was nonmissing.
Math CST: Geometry	Equal to 1 if student took the Geometry CST test; equal to 0 if student did not take the Geometry CST test and the value was nonmissing.
Math CST: Algebra II	Equal to 1 if student took the Algebra II CST test; equal to 0 if student did not take the Algebra II CST test and the value was nonmissing.
Math CST: Unknown	Equal to 1 if Math CST taken was missing for student; equal to 0 if student's Math CST taken was nonmissing.
Outcomes	
ELA EAP	Equal to 1 if student scored conditionally ready or ready for college-level work in ELA on the California State University Early Assessment Program (EAP); equal to 0 if student scored not ready for college-level work in ELA. Missing if student did not take the exam or less than 50% of students in student's district and cohort took the exam in their 11th-grade year.
GPA	Grade point average according to CSU system's formula to calculate high school GPA for applicants, which was based only on student's grades in a–g courses taken in the 10th and 11th grades. Does not allocate additional points if student successfully completed honors courses. Calculated only for students who did not drop out.
Credits accumulated	Sum of credits for all classes in which students received a passing grade through the students' 12th-grade year. Calculated only for students who did not drop out.

Exhibit A-10

Data Elements for High School Outcomes Analysis (concluded)

Completion of a–g course requirements	Equal to 1 if, by the end of the 12th grade, student earned a C or higher in the following numbers of courses: eight semester courses of English (b); six semester courses of math (c); four semester courses each of history/social science (a), laboratory science (d), and language other than English (e); and two semester courses each of visual and performing arts (f) and a college-prep elective (g). Bilingual students were not required to complete four semester courses of a language other than English (e). We could not identify bilingual students in the data and assumed that the number of bilingual students did not systematically differ for certified pathway, non-certified pathway, and traditional high school students. Equal to 0 if these requirements were not met. Calculated only for students who did not drop out.
Number of a–g course requirements completed	Number of a–g semester courses completed with a grade of C or higher; we did not count courses above the number required for admission to a 4-year university (e.g., more than two semesters of g courses). We also excluded a–g courses taken in middle school because we lacked consistent course data for grades before the 9th grade; however, if middle school students took math standardized tests in subjects more advanced than Algebra I (e.g., Geometry or Algebra II), we assumed that they successfully completed two semester courses of math while in middle school. Calculated only for students who did not drop out.
Dropout	Equal to 1 if student dropped out before the 12th grade; equal to 0 if student did not drop out before 12th grade; missing if student transferred out of a Linked Learning district or left district for a reason not related to dropout (e.g., illness).
Graduation	Equal to 1 if student received a standard high school diploma; equal to 0 if student did not receive a standard high school diploma and the value was nonmissing; missing if student transferred out of a Linked Learning district or left district for any other reason.

Exhibit A-11 shows the cohorts we were missing data for in each district by each outcome variable. Shading indicates that the data were missing by design: we did not request data for the 2013 cohort from Los Angeles, Montebello, Oakland, Sacramento, or West Contra Costa, and we do not yet have the data for 12th-grade outcomes for the 2015 cohort.[44] A solid dot indicates that we received these data but were unable to use them because they were not of sufficient quality.

For the analysis of ELA EAP, we included only districts and cohorts where at least 50% of students in that district and cohort took the ELA EAP exam in their 11th-grade year. Los Angeles, which did not administer the exam to any of its students, is shaded for ELA EAP, whereas districts that did not reach the 50% threshold for the 2015 cohort are marked with a solid dot.

[44] The 12th-grade outcomes were total credits accumulated, number of a–g course requirements completed, whether all a–g course requirements were met, dropout, and graduation.

Exhibit A-11
Data Availability

Variable	Graduation Cohort	Antioch	Long Beach	Los Angeles	Montebello	Oakland	Pasadena	Porterville	Sacramento	West Contra Costa
Dropout	2013									
	2014									
	2015									
Graduation	2013									
	2014									
	2015									
Credits	2013	●								
	2014	●				●			●	
	2015									
a–g Courses/ Completion	2013	●								
	2014	●				●			●	
	2015									
GPA	2013	●								
	2014	●				●			●	
	2015	●				●			●	
ELA EAP	2013									
	2014									
	2015		●			●	●			●

KEY	
●	Data unreliable
	Data unavailable or not yet available
	Data included in analysis

Analytic Sample

We took a number of steps to make the student-level data received from the nine Linked Learning districts usable for our analysis. We determined the analytic sample for each model based on the number of cases with nonmissing values for all covariates (student demographic, cohort, and achievement data) and outcome variables required for that model. The analytic sample therefore varied across outcomes, even for students within the same district. To create the analytic sample, we made the following exclusions:

- Students with missing values for our covariates were excluded. Approximately 17% of students in the final sample were excluded because of missing covariates, mainly due to missing prior achievement data.[45]
- Given our intent-to-treat analytic approach (see Analysis Methods section below), we excluded students who were not enrolled in one of the nine districts the year their pathway or traditional high school program began.
- We excluded students in alternative or continuation schools because their high school experiences were not comparable to pathways or traditional high school programs.
- We did not analyze credit-related outcomes (credits, number of a–g courses and a–g completion, GPA) in Antioch, Oakland, or Sacramento because of unreliable course enrollment data.
- For purposes of model convergence, we excluded a small number of students who, before enrolling in a pathway or traditional high school, took a Math CST exam that five or fewer students overall had taken.

In addition, to minimize data errors, we also implemented a number of additional cleaning steps:

- We excluded students in wall-to-wall schools with no pathway designation.
- We excluded students in any programs with fewer than 20 students in the analytic sample (after making the exclusions described above), as we deemed these programs too small to estimate an accurate outcome while controlling for all necessary variables.

Descriptive Statistics

Exhibits A-12 through A-15 display descriptive statistics for students in certified pathways, non-certified pathways, and traditional high school programs. These tables present the sample sizes, means, and standard deviations (for continuous variables) or percentages (for dichotomous variables) for all students in all districts who were included in the analytic sample for any outcomes analysis. We provide these overall descriptive statistics to allow for an understanding of how the characteristics of students who enrolled in certified pathways might differ from those of students in non-certified pathways or traditional high school programs. The tables show student demographics, student achievement data, and outcomes data, respectively. Note that sample sizes vary both by and within tables because of the variation in available data between districts and cohorts, so we provide the number of students in each program type in the first table only. We provide the number of students included in each analysis in the outcomes tables.

[45] Districts were able to provide middle school data for only those students who attended middle school within the district. This limitation excluded approximately half the students in Porterville Unified, which has several feeder elementary districts.

Exhibit A-12
Demographics and Cohort Variables

	Overall	Certified Pathway	Non-Certified Pathway	Traditional High School
n	46,482	4,979	20,790	20,713
Female	49.7%	51.8%	50.4%	48.5%
Low SES	78.7%	78.2%	78.2%	79.4%
White	12.7%	14.8%	10.0%	14.8%
Latino	58.0%	60.5%	59.0%	56.4%
African American	14.7%	14.3%	15.0%	14.5%
Asian	13.8%	9.5%	15.4%	13.3%
Other Race / Ethnicity	0.8%	0.9%	0.5%	1.0%
Gifted and Talented	3.2%	2.2%	2.6%	4.0%
Low Prior Achievement	24.3%	20.5%	24.3%	25.1%
Special Education	8.0%	6.2%	7.1%	9.3%
Reclassified Fluent English Proficient	26.3%	26.9%	27.1%	25.4%
Initial Fluent English Proficient	8.0%	8.5%	8.1%	7.7%
English Only	45.0%	45.4%	42.0%	47.9%
English Language Learner	20.7%	19.2%	22.7%	19.0%
Class of 2013	18.5%	19.3%	21.1%	15.8%
Class of 2014	41.3%	34.4%	40.1%	44.3%
Class of 2015	40.1%	46.3%	38.8%	39.9%
Pathway Starts in 10th Grade	19.1%	23.9%	23.5%	13.5%

Exhibit A-13
Test Descriptives by Grade[a]

		Overall	Certified Pathway	Non-certified Pathway	Traditional High School
7th Grade					
	ELA CST	326	336	326	325
	SD	(55)	(56)	(53)	(56)
	Math CST	325	340	325	323
	SD	(61)	(61)	(60)	(61)
8th Grade					
	ELA CST	348	356	348	347
	SD	(61)	(57)	(61)	(61)
	Math CST	343	346	348	338
	SD	(70)	(69)	(72)	(69)
9th Grade					
	ELA CST	332	333	332	332
	SD	(59)	(55)	(57)	(65)
	Math CST	297	300	298	293
	SD	(56)	(58)	(54)	(58)

[a] Sample size differs by cell.

Exhibit A-14
Test Type Descriptives[a]

	Overall	Certified Pathway	Non-certified Pathway	Traditional High School
Prior Math Test Type				
Math CST: Grade-Level Math	4.5%	3.0%	3.2%	6.1%
Math CST: General Math	33.1%	24.1%	32.6%	35.7%
Math CST: Algebra I	52.8%	63.4%	54.3%	48.7%
Math CST: Geometry	8.7%	9.1%	8.8%	8.5%
Math CST: Algebra II	0.9%	0.4%	1.0%	0.9%
Math CST: Unknown	0.0%	0.0%	0.0%	0.0%
Prior Test Period				
Math CST Two Years Before Pathway Start	4.8%	3.0%	3.3%	6.6%
ELA CST Two Years Before Pathway Start	4.9%	2.9%	3.4%	6.8%

[a] Sample size differs by cell.

Exhibit A-15
Outcomes Descriptives[a]

		Overall	Certified Pathway	Non-certified Pathway	Traditional High School
Dropout					
	Average	10%	7%	10%	10%
Graduation					
	Average	77%	83%	78%	74%
Credits Accumulated					
	Average	226	236	226	223
	SD	(47)	(53)	(45)	(47)
Completion of a–g Course Requirements					
	Average	30%	31%	30%	29%
Number of a–g Course Requirements Met					
	Average	22.7	23.7	22.7	22.3
	SD	(7.4)	(6.5)	(7.2)	(7.8)
GPA					
	Average	1.82	1.95	1.82	1.78
	SD	(0.88)	(0.83)	(0.87)	(0.90)
Conditionally Ready or Ready for College-Level Work in ELA					
	Average	32%	39%	31%	31%

[a] Sample size will differ by cell. See regression tables for sample sizes for each cell.

Analysis Methods

We used statistical controls to compare outcomes for certified and non-certified 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 could not control for unobserved and unmeasured characteristics of students, however, such as motivation and parental support. Our analyses therefore can neither shed light on nor adjust for ways these unobserved characteristics may differ between pathway and traditional high school students. For this reason, we cannot conclusively conclude whether pathway participation improved high school outcomes for students.

As in prior years of the evaluation, we estimated an intent-to-treat effect and classified students as participating in a pathway if they were enrolled in it in the first year the pathway was offered (in either the 9th or 10th grade); for students in traditional high school programs, their program classification was based on their school enrollment in the same academic year.

To estimate the differences between pathway students and similar peers in traditional high schools on continuous outcome variables (i.e., number of a–g course requirements completed, GPA, and credit accumulation), we used a hierarchical linear model with random effects at the student and pathway levels. We used a vector of indicators for the student's district and cohort to control for fixed effects of each district and cohort. Outcome *Y* for student *i* in pathway *j* is given as

$$Y_{ij} = \beta + (\mathbf{PW_{ij}})\boldsymbol{\pi} + (\boldsymbol{X_{ij}} - \bar{\boldsymbol{X}})\boldsymbol{\zeta} + \alpha_j + \varepsilon_{ij}$$

Where:

Y_{ij} = outcome *Y* for student i in pathway j.

$\mathrm{PW_{ij}}$ = vector of dummies representing pathway classification (certified pathway and non-certified pathway, with traditional high schools omitted as reference).

X_{ij}= vector of covariates, including district and cohort fixed effects and student prior achievement and demographics. Prior achievement variables consisted of the student's math and ELA CST score from the year before entering the pathway,[46] a vector of dummies indicating the math CST exam taken,[47] and an indicator for the pathway beginning in the 10th grade. Demographic variables consisted of a series of indicators for student gender, ethnicity, English language proficiency, special education status, gifted and talented status, and low socioeconomic status. All variables were grand-mean centered.

α_j= pathway random effect.

ε_{ij}= student random effect.

The π coefficients therefore provided the estimate of the difference between pathway students (in each certified and non-certified category) and traditional high school students, controlling for all variables captured by X_{ij}.

[46] We controlled for achievement 1 year before the pathway or high school start, and to minimize the number of students excluded from the analyses, we used achievement 2 years before the pathway or high school start when achievement in the prior year was missing; our models accounted for this difference.

[47] Five students in the analytic sample who took the Summative High School Math CST exam, three students who took the Integrated Math I exam, and one student who took the Integrated Math II exam were dropped from the analysis because fewer than five students took either exam type. With so few students taking these two types of exams, they were not representative of the analytic sample and prevented convergence of the maximum-likelihood estimator.

As all covariates were grand-mean centered, our estimates predicted differences for an "average" student in the sample. We predicted models using a continuous outcome variable using Stata 14's *mixed* command. Models predicting binary outcomes (high school graduation, dropping out of high school, completion of all a–g course requirements, and at least conditionally ready on the EAP exam) used the *meqrlogit* command. For logistic models, we transformed the estimates into probabilities to present in the main report but provide untransformed results in these appendix tables. We use the standard $p < .05$ threshold to determine statistical significance throughout this report, however in Exhibits A-16 through A-27 we also note estimates that are marginally significant at $p < .1$.

Results for Certified and Non-certified Pathways for All Students

Exhibits A-16 and A-17present all estimates for certified and non-certified pathways for all students, along with their significance level, the associated standard error, and sample sizes at both student and academic program levels.

Exhibit A-16
Binary Outcomes for Certified and Non-certified Pathways

Dropout	Certified		Non-certified	
Point Estimate[a]	-0.28	*	-0.03	
SE	0.12		0.08	
Student *n*	26,221		26,221	
Cluster *n*	167		167	
Graduation				
Point Estimate[a]	0.27	*	-0.01	
SE	0.13		0.09	
Student *n*	25,591		25,591	
Cluster *n*	165		165	
Completion of a–g Requirements				
Point Estimate[a]	-0.19		-0.35	~
SE	0.24		0.19	
Student *n*	15,466		15,466	
Cluster *n*	117		117	
Conditionally Ready or Ready for College-Level Work in ELA				
Point Estimate[a]	0.32	*	-0.08	
SE	0.15		0.13	
Student *n*	23,459		23,459	
Cluster *n*	151		151	

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

[a] Point estimates are presented in logits without transformations to allow for comparisons to standard errors of these estimates.

Exhibit A-17
Continuous Outcomes for Certified and Non-certified Pathways

Credits Accumulated	Certified		Non-certified
Point Estimate[a]	13.32	***	3.70
SE	3.89		3.16
Student *n*	15,347		15,347
Cluster *n*	117		117
Number of a–g Course Requirements Completed			
Point Estimate[a]	0.78		-0.31
SE	0.48		0.38
Student *n*	15,466		15,466
Cluster *n*	117		117
GPA			
Point Estimate[a]	0.14	**	-0.02
SE	0.05		0.05
Student *n*	28,987		28,987
Cluster *n*	127		127

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

Results for Subgroups in Certified and Non-certified Pathways

Exhibits A-18 through A-27 present all estimates for subgroup students' outcomes in certified and non-certified pathways. We analyzed outcomes separately for students with low prior achievement, English learners, African Americans, Latinos, and females. For these analyses, we limited the sample used in the overall outcome estimates to those students in the subgroup of interest. Results can therefore be thought of as outcomes for subgroup students in certified and non-certified pathways relative to outcomes for similar students of the same subgroup who attended traditional high schools. All certified and non-certified pathway estimates are presented, along with their significance level, the associated standard error, and the sample sizes at both student and pathway levels.

Exhibit A-18
Binary Outcomes for Certified and Non-Certified Pathways for Students with Low Prior Achievement

Dropout	Certified		Non-Certified
Point Estimate[a]	-0.38	*	-0.10
SE	0.17		0.10
Student *n*	6,281		6,281
Cluster *n*	157		157
Graduation			
Point Estimate[a]	0.28	~	0.06
SE	0.16		0.12
Student *n*	6,098		6,098
Cluster *n*	155		155

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

[a] Point estimates are presented in logits without transformations to allow for comparisons to standard errors of these estimates.

[b] Because of the small number of students with low prior achievement who either passed the ELA EAP exam or completed the full set of college-prep requirements in either pathway or traditional high school settings, we were unable to estimate any differences on these outcomes.

[c.] We use the standard $p < .05$ threshold to determine statistical significance. Under this standard, these results would be considered marginally significant at $p < .1$.

Exhibit A-19
Continuous Outcomes for Certified and Non-Certified Pathways for Students with Low Prior Achievement

Credits Accumulated	Certified		Non-Certified
Point Estimate[a]	21.82	***	5.29
SE	5.38		4.20
Student *n*	2,761		2,761
Cluster *n*	104		104
Number of a–g Course Requirements Completed			
Point Estimate[a]	1.90	*	0.30
SE	0.80		0.62
Student *n*	2,849		2,849
Cluster *n*	105		105
GPA			
Point Estimate[a]	0.16	**	-0.01
SE	0.06		0.05
Student *n*	6,187		6,187
Cluster *n*	124		124

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

Exhibit A-20
Binary Outcomes for Certified and Non-Certified Pathways for English Learners[a]

Dropout	Certified	Non-Certified	
Point Estimate[b]	-0.12	0.12	
SE	0.19	0.13	
Student *n*	5,196	5,196	
Cluster *n*	159	159	
Graduation			
Point Estimate[b]	0.16	-0.23	~
SE	0.17	0.12	
Student *n*	5,015	5,015	
Cluster *n*	157	157	

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

[a] Because of the small number of students with low prior achievement who either passed the ELA EAP exam or completed the full set of college-prep requirements in either pathway or traditional high school settings, we were unable to estimate any differences on these outcomes.

[b] Point estimates are presented in logits without transformations to allow for comparisons to standard errors of these estimates.

Exhibit A-21
Continuous Outcomes for Certified and Non-Certified Pathways for English Learners

Credits Accumulated	**Certified**		**Non-Certified**
Point Estimate[a]	15.19	**	.31
SE	4.94		3.80
Student *n*	2,653		2,653
Cluster *n*	108		108
Number of a–g Course Requirements Completed			
Point Estimate[a]	1.30	~	0.27
SE	0.70		0.54
Student *n*	2,714		2,714
Cluster *n*	109		109
GPA			
Point Estimate[a]	0.09		-0.05
SE	0.06		0.05
Student *n*	5,965		5,965
Cluster *n*	126		126

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

Exhibit A-22
Binary Outcomes for Certified and Non-Certified Pathways for African American Students[a]

Dropout	Certified	Non-Certified	
Point Estimate[b]	-0.12	-0.20	
SE	0.20	0.14	
Student *n*	3,899	3,899	
Cluster *n*	144	144	
Graduation			
Point Estimate[b]	0.21	0.32	*
SE	0.20	0.15	
Student *n*	3,880	3,880	
Cluster *n*	143	143	
Completion of a–g Requirements			
Point Estimate[b]	0.37	-0.05	
SE	0.37	0.31	
Student *n*	1,836	1,836	
Cluster *n*	86	86	

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

[a] The model could not produce estimates of the effect of pathway participation on passing the ELA EAP exam with the smaller sample of African American students. Multilevel models will occasionally not converge for a number of reasons. In this case, we had a small sample with few level 2 units and numerous covariates. When we estimated a simpler multiple linear regression model that did not take into account the multilevel structure of the data, there were no effects of pathway participation on passing the ELA EAP exam for African American students.

[b] Point estimates are presented in logits without transformations to allow for comparisons to standard errors of these estimates

Exhibit A-23
Continuous Outcomes for Certified and Non-Certified Pathways for African American Students

Credits Accumulated	Certified		Non-Certified	
Point Estimate[a]	29.34	***	13.05	**
SE	6.23		5.06	
Student *n*	1,811		1,811	
Cluster *n*	86		86	
Number of a–g Course Requirements Completed				
Point Estimate[a]	1.11		0.30	
SE	0.89		0.73	
Student *n*	1,836		1,836	
Cluster *n*	86		86	
GPA				
Point Estimate[a]	0.03		-0.10	
SE	0.07		0.06	
Student *n*	3,203		3,203	
Cluster *n*	103		103	

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

Exhibit A-24
Binary Outcomes for Certified and Non-Certified Pathways for Latino Students

Dropout	Certified		Non-Certified	
Point Estimate[a]	-0.24	~	0.06	
SE	0.14		0.10	
Student *n*	14,950		14,950	
Cluster *n*	166		166	
Graduation				
Point Estimate[a]	0.28	~	-0.14	
SE	0.14		0.11	
Student *n*	14,376		14,376	
Cluster *n*	164		164	
Completion of a–g Requirements				
Point Estimate[a]	-0.30		-0.35	~
SE	0.25		0.21	
Student *n*	9,494		9,494	
Cluster *n*	115		115	
Conditionally Ready or Ready for College-Level Work in ELA				
Point Estimate[a]	0.21		-0.13	
SE	0.17		0.15	
Student *n*	12,945		12,945	
Cluster *n*	149		149	

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

[a] Point estimates are presented in logits without transformations to allow for comparisons to standard errors of these estimates.

Exhibit A-25
Continuous Outcomes for Certified and Non-Certified Pathways for Latino Students

Credits Accumulated	Certified		Non-Certified
Point Estimate[a]	13.90	***	2.92
SE	4.11		3.32
Student *n*	9,413		9,413
Cluster *n*	115		115
Number of a–g Course Requirements Completed			
Point Estimate[a]	0.50		-0.64
SE	0.51		0.41
Student *n*	9,494		9,494
Cluster *n*	115		115
GPA			
Point Estimate[a]	0.12	*	-0.04
SE	0.06		0.05
Student *n*	18,839		18,839
Cluster *n*	127		127

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

Exhibit A-26
Binary Outcomes for Certified and Non-Certified Pathways for Female Students

Dropout	Certified		Non-Certified	
Point Estimate[a]	-0.32	*	0.01	
SE	0.15		0.10	
Student *n*	13141		13,141	
Cluster *n*	166		166	
Graduation				
Point Estimate[a]	0.38	**	0.03	
SE	0.14		0.10	
Student *n*	12834		12,834	
Cluster *n*	164		164	
Completion of a–g Requirements				
Point Estimate[a]	-0.34		-0.37	~
SE	0.25		0.20	
Student *n*	7976		7,976	
Cluster *n*	116		116	
Conditionally Ready or Ready for College-Level Work in ELA				
Point Estimate[a]	0.29	~	-0.04	
SE	0.18		0.15	
Student *n*	12115		12,115	
Cluster *n*	151		151	

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$

[a] Point estimates are presented in logits without transformations to allow for comparisons to standard errors of these estimates.

Exhibit A-27
Continuous Outcomes for Certified and Non-Certified Pathways for Female Students

Credits Accumulated	Certified		Non-Certified
Point Estimate[a]	14.10	**	3.64
SE	4.34		3.53
Student *n*	7,925		7,925
Cluster *n*	116		116
Number of a–g Course Requirements Completed			
Point Estimate[a]	0.32		-0.34
SE	0.49		0.39
Student *n*	7,976		7,976
Cluster *n*	116		116
GPA			
Point Estimate[a]	0.11	~	-0.04
SE	0.06		0.05
Student *n*	14,643		14,643
Cluster *n*	127		127

~$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$