Student-Centered Schools: Closing the Opportunity Gap

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Executive Summary

Student-Centered Schools: Closing the Opportunity Gap documents the practices and outcomes of four urban high schools that, through student-centered approaches, are preparing their students for success in college, career, and life by providing them with the building blocks of knowledge and skills they will need as adults.

The schools in the study are non-selective in their admissions and serve populations that are predominantly low-income students of color. The studies focus on schools using student-centered practices through either the Linked Learning initiative or Envision Education model. Linked Learning, a state-wide initiative, integrates rigorous academics with career-based learning and real-world workplace experiences. Envision Education is a small charter network that creates personalized learning environments for students to develop 21st century skills such as critical thinking, problem solving, and collaboration. Table 1 provides an overview of the school demographics.

Table 1: Study School Demographics 2012–2013

School Characteristics	City Arts and Technology High School	Dozier-Libbey Medical High School	Impact Academy of Arts and Technology	Life Academy
Type of school	District-approved independent charter	District school engaged in Linked Learning	District-approved independent charter	District school engaged in Linked Learning
District or CMO affiliation	Chartered by San Francisco Unified and operated by Envision Education	Antioch Unified School District	Chartered by Hayward Unified and operated by Envision Education	Oakland Unified School District
Student enrollment	397	639	462	338
% free/reduced lunch	70%	48%	59%	99%
% Students of color	92%	78%	90%	98%

Source: http://dq.cde.ca.gov/dataquest/

The Context: Why Student-Centered Learning Matters for Students

For the past 13 years, as an unintended consequence of No Child Left Behind (NCLB), the nation has moved to an increasingly inequitable educational system as low-performing schools, particularly those serving low-income students of color in segregated settings, more and more relied on drill-and-kill direct instruction of basic skills primarily

in English and math. In fact, most high schools in the United States remain structured for an industrial era when few graduates attended college or had professional careers. However, specialized skills and knowledge are now required for at least 70% of jobs. Low-income students and students of color are particularly unprepared as they are more than likely to attend segregated schools with a narrow and impoverished curriculum.

Despite the many forces limiting learning opportunities for low-income students and students of color over the last decade, some schools have managed to create a context within which rich, engaging curriculum is offered to all students in a manner that personalizes education and supports students' individual needs. In this study, we selected schools that embody the following features of student-centered schools:

- Curriculum, instruction, and assessments are designed to help students engage in the learning process and develop analytical, collaboration, and communication skills. Formative assessments enable teachers to understand how and what students are learning so they can support student mastery of content, skills, and dispositions.
- School structures support personalization and connections to adults within the school and to the community outside of school. Teachers work together to focus on students' strengths, interests, and needs; to engage in their own learning; and to collaborate on the improvement of their instructional practices.
- Leadership is shared among the adults in the building with a specific focus on incorporating the voices of teachers, staff, administrators, and parents in key decisions.

We found that schools that incorporate these key features of student-centered practice are more likely to develop students who have transferrable academic skills; feel a sense of purpose and connection to school; as well as graduate, attend, and persist in college at rates that exceed their district and state averages.

What Are the Results of a Student-Centered Learning Approach?

Analysis of outcomes for students at all four study schools confirms that they are outperforming most other schools in their respective communities that are serving similar populations, especially African American, Latino, low-income students, and English language learners. This is evident in graduation, student achievement, and college preparatory course completion data; college persistence data; and surveys of graduates.

Outperforming peers on state assessments

After accounting for prior learning, students in the study schools exhibited greater gains in achievement on the California Star Test (English language arts) and California High School Exit Exams (ELA and mathematics) than similar students attending other

schools in the same district. In particular, our analysis shows the value added to student learning in the study schools is even greater for students from economically disadvantaged backgrounds and those whose parents had not attended college.

Graduating more students

The study schools' high school graduation rates exceed district and state averages. Particularly noteworthy is the high graduation rate for African American students at Dozier-Libbey and Impact Academy: 90-95% of African American students at these schools graduate, compared to district and state averages of about 66%. The graduation rate for Latino students, English learners, and economically disadvantaged students is also high for three of four schools, ranging from 10% to 24% higher than state averages at City Arts and Tech, Dozier-Libbey, and Impact Academy.

Making students eligible for college

These schools strive to do more than graduate their students, they seek to open the doors to college and provide students with the tools they need to persist in college. Key to gaining access to the California state system is completion of the required "a-g" college preparatory courses in high school (4 years of English, 3 years of math, 2 years of lab science, and foreign language and arts course requirements).

Statewide, there are sizable gaps between a-g completion rates of low-income students and students of color when compared to White and Asian students. The student-centered schools in this study—by structuring their course offerings, and in some cases their graduation requirements, to be compliant with the a-g requirements—are dramatically overcoming this statewide gap for their students. Table 2 provides an overview of each of the schools' California college course completion rates.

Table 2: College Preparatory Course Completion Rates 2011–2012

Graduation rates	Types of students	CAT	District	Dozier-Libbey	District	Impact Academy	District	Life Academy*	District	State
Percent of graduates completing all courses required for UC/CSU admission	All	99%	56%	96%	24%	100%	44%	87%	51%	38%
	African American	100%	28%	94%	15%	100%	34%	100%	34%	29%
	Latino	100%	36%	100%	15%	100%	39%	82%	54%	28%
	Limited English proficient	100%	38%	92%	24%	100%	34%	n/a	46%	23%
	Socioeconomically disadvantaged	100%	54%	95%	22%	100%	45%	n/a	48%	30%

Source: Data for all sources except Life Academy from http://dq.cde.ca.gov/dataquest/

**Life Academy data from Oakland Unified School District*

At City Arts and Tech, Dozier-Libbey, and Impact Academy, 96-100% of students have completed the California college course requirements. Life Academy, while having somewhat lower rates than the other three schools, serves a higher-need student population than the others and won recognition from its district for having the highest a-g completion rates of any high school in the district.

Persisting in college

The student-centered schools in this study have designed their curriculum purposefully to provide students with not only the kinds of academic skills they need to do college-level academic work, but also the fortitude to persist through challenges and to be successful in their chosen careers as well. Beyond enrolling in college, the quality of students' high school preparation influences their persistence rate in college.

For students from City Arts and Tech, 97%, and for Life Academy, 69%, of graduates enrolled in 4-year colleges were still enrolled in their 4th year of college. These rates far exceed national averages, particularly for students who are first in their family to attend college. Survey data of graduates suggest that particular high school practices of relationship-building, high standards, deep learning, and instructional relevance contribute to students' success in college.

School Practices That Promote Student Success

Through interviews, observations, and teacher and student survey data, the study unpacks the components of student-centered practices to more fully understand the on-the-ground realities of how they play out in schools with students typically underserved by the educational system. Despite their different approaches, all four schools have many characteristics in common. A defining characteristic of each study school is a strong school vision that includes an unrelenting belief that every student has the potential to achieve high academic standards and to attend college. The schools' visions shape what students are expected to know and do when they graduate, how students are assessed and taught, and the ways they are supported to achieve these goals.

Building relationships with students

Personalization is a set of practices that enable adults to know students well and tailor their interactions to meet individual students' strengths, interests, and needs. The common personalization practices in the schools in this study include advisory programs, a culture of celebration, student voice and leadership opportunities, and connections to parents and community. Undergirding each of these practices is the explicit expectation that a core component of teachers' jobs is to build relationships with their students.

Rigorous, relevant, and engaging instruction and assessments

Preparing students for college and careers requires increasing the focus on the development of the analytical and communication skills needed to navigate and excel in a

dynamic, information-rich environment. To build these skills, each of the four schools places a central focus on supporting students' leadership capacities and autonomy within the classroom, emphasizing the importance of students connecting with and applying what they are learning through culminating performance-based assessments. In particular, the schools draw on:

- relevant curricula,
- inquiry-based instruction,
- collaborative learning,
- student-directed learning,
- a focus on mastery,
- flexible uses of time,
- ongoing assessments, and
- performance-based assessments.

Academic supports for student success

Student-centered practices are often reserved for students who enter high school well-prepared, self-confident, and motivated. Additional supports are necessary to adopt these strategies in schools serving students who lack basic skills and self-confidence and who face constant external challenges to persist in school. To meet the needs of students who enter with low academic skills and face educational challenges related to poverty or language fluency, the schools have adopted in-class and out-of-class strategies to support students' ongoing academic development. These strategies include the use of advisory to provide academic support, differentiated instruction, tutorial and after-school support, and the provision of additional resources and support to English language learners and special education students.

Shared leadership and professional development

Creating and sustaining schools committed to student-centered personalization and instructional practices requires substantial investment in developing and supporting staff capacity. This capacity-growing has multiple elements, including an investment in creating a shared school-wide vision; supporting grade-level teacher collaboration; enriching teacher expertise in pedagogy, curriculum, assessment, and academic support; providing opportunities for staff to reflect on their practice; distributing leadership to include teachers; and utilizing external support from the district or charter management organization and community partners.

Supports That Enable Student-Centered Schools

All schools that are serious about closing the opportunity gap need support at multiple levels, including internal school-level supports for teachers, from the district or charter management organization level, and outward to the state and federal levels. In this research, we identified three areas of support that substantially influence the ability of

high schools to engage in student-centered practices: funding, human capital, and instruction and assessment policies.

Funding student-centered schools

Until 2013, California schools faced year after year of budget cuts and a complicated funding system in which schools had little autonomy over how to spend their decreasing resources. In 2013, California implemented the Local Control Funding Formula, a weighted student formula that enables schools serving high-need populations to receive additional funding. This funding formula has the potential to dramatically change the quality of resources available to schools with high percentages of low-income students, English language learners, and foster children. While this is a substantial improvement over the previous state funding system, it remains to be seen whether the increased funding will be sufficient, as California still lags behind other states in per pupil funding. But as a model, it holds tremendous promise for other states to consider.

Human capital policies that support student-centered teachers and leaders in urban schools

Addressing human capital needs is the heart of transforming outcomes for students. Teachers need to enter the profession well-prepared to address students' academic as well as social emotional needs. Once in the profession, teachers and administrators need ongoing support to analyze and revise their practice. Schools will benefit from local, state, and federal policies that:

- invest in and set standards for high-quality teacher education,
- address inequities in teacher salaries between districts,
- invest in teacher induction programs,
- provide time for teacher collaboration to plan curriculum,
- follow principles for meaningful professional development, and
- revamp teacher evaluation to encourage inquiry and collaboration.

Implementing student-centered instruction and assessments

Student-centered instruction, which includes project-based instruction, collaborative learning, relevant curriculum, and performance-based assessments, is challenging to enact effectively. States and districts can support these rich learning environments for students by creating a balance between common goals and local opportunities for invention and innovation that are tailored to the needs of students and schools.

- States and districts should ensure that educators are prepared not with a single pedagogy but with a wide repertoire of strategies that support student-centered learning in both teacher-directed and student-directed ways.
- Similarly, states should limit directives to schools that constrain practice in ways that may not be productive for all students, but instead document and disseminate successful practices and support schools in

learning from the research and from each other through conferences, networks, site visits, and other strategies.

- Finally, states should adopt a limited set of state-level assessments that support the kinds of deeper learning opportunities central to student-centered schools, and then encourage local use of even more robust assessments that allow students to inquire, investigate, collaborate, present, and defend their ideas, as well as to think critically and be creative.

Why Student-Centered Schools?

Student-Centered Schools: Closing the Opportunity Gap documents the practices and outcomes of four urban high schools in California that through student-centered approaches are preparing their students for success in college, career, and life by providing them with the building blocks of knowledge and skills they will need as adults. These non-selective schools serve populations that are predominately low-income students of color and represent two signature models of student-centered practices in California, Envision Education and Linked Learning. The schools featured in this study, representing both district and charter schools, are City Arts and Technology High School in San Francisco, Impact Academy of Arts and Technology in Hayward, Dozier-Libbey Medical High School in Antioch, and Life Academy in Oakland. With college prep course enrollment and graduation rates significantly higher than the district and state averages for African American, Latino, and economically disadvantaged students, these schools offer real promise of approaches to narrow the opportunity gap. Through case studies of these four diverse schools, the Student-Centered Schools study highlights the key student-centered practices of these schools as well as the supports necessary to facilitate the implementation of these practices.

The Context: Why Student-Centered Learning Matters for Students

For the past 13 years, as an unintended consequence of No Child Left Behind (NCLB), the nation has moved to an increasingly inequitable system as low-performing schools, particularly those serving low-income students of color in segregated settings, more and more relied on drill and kill direct instruction of basic skills primarily in English and math. In fact, most high schools in the United States remain structured for an industrial era when few graduates attended college or had professional careers. However, specialized skills and knowledge are now required for at least 70% of jobs (Darling-Hammond, 2010). Low-income students and students of color are particularly unprepared as they are more than likely to attend segregated schools with a narrow one-size-fits-all curriculum (Darling-Hammond, 2010; Ravitch, 2010).

The narrowing of the curriculum and a focus on "teaching to the test" has occurred on some level in all schools across the board but disproportionally in schools serving low-income students and students of color. Schools serving more affluent students managed to maintain the inclusion of social studies, science, and the arts in their instruction as well as a focus on problem solving and critical thinking. Studies show that NCLB led to changes in how instructional time and curricular choices were made in all schools, but particularly those flagged for improvement. Low-performing schools increased instructional time dedicated to tested subjects and decreased time spent on instruction in non-tested subjects, thus widening the gap in terms of the types of knowledge and skills that

students are exposed to largely based on their socio-economic and ethnic background (Au, 2007; McMurrer, 2007). Furthermore, teachers in these settings report that their "personal and professional identity [is] thwarted, creativity and autonomy undermined, and an ability to forge relationships with students diminished" (p. 512, Crocco and Costigan, 2007).

As the schools became more segregated and inequitable, the gap between *how* and *what* is taught to children has also become similarly unjust. In order to meet NCLB's nearly impossible goal of 100% proficiency by 2014, schools and districts began allocating hundreds of millions of dollars to testing and test prep, and in some schools, almost 20 percent of instruction during the school year became dedicated to test prep thereby significantly constricting the curriculum (Ravitch, 2013). This response, while often providing a modest bump in high-stakes standardized test scores, exacerbated the gap between the school experiences of (a) low-income and (b) middle- and upper-middle-class students in U.S. schools and did not secure gains on assessments of higher-order skills.

The latest OECD Program for International Student Assessment (PISA) results illustrate the socioeconomic student achievement gap. Students in disadvantaged schools in the United States—those in which the socioeconomic profile of the students is statistically significantly below that of the national average—had a mean mathematics score on PISA below the OECD mean, and comparable with the mean scores of countries like Bulgaria, the United Arab Emirates, Kazakhstan, and Thailand. American students in advantaged schools had achievement levels that were significantly greater than the OECD average and comparable with the mean performance of high achieving countries such as Switzerland, the Netherlands, Canada, and Finland (OECD, 2013).

Despite the many forces limiting learning opportunities for low-income students and students of color over the last decade, some schools have managed to create a context within which a rich, engaging curriculum is offered to all students in a manner that personalizes education and supports students' individual needs. In this study, we selected schools that embody the following features of student-centered schools:

- Curricula, instruction, and assessments are designed to help students engage in the learning process and allow teachers to understand how students are learning, what they are learning, and how to use their learning to solve real-world problems.
- School structures support personalization and connections to adults within the school and to the community outside of school. Teachers work together to focus on the learning needs of students, to engage in their own learning, and to collaborate on the improvement of their instructional practices.

- Leadership is shared among the adults in the building with a specific focus on incorporating the voices of teachers, staff, administrators, and parents in key decisions.

We found that schools that incorporate these key features of student-centered practice are more likely to develop students who have transferrable academic skills, feel a sense of purpose and connection to school, graduate, and go on to college at higher rates.

Relevance of This Study

The policy climate in which schools and teachers operate is a critical part of what makes this work particularly timely. Growing acknowledgement that high schools, especially those with traditionally underserved populations, are not preparing all students adequately for college and career success has sparked a series of reform efforts. Under the Obama administration, two major initiatives have created a new demand for curriculum and assessment reform such that schools will foster students' development of "21st century skills."

The first is the development of the Common Core State Standards (CCSS) that emphasize critical thinking and analytic skills for college and career readiness that are not easily assessable through traditional multiple choice testing. These standards intend to create fewer, higher, and deeper curriculum goals (Darling-Hammond, 2010). Deeper learning and student-centered practices are well-aligned with the goals of CCSS (Conley, 2011; National Research Council, 2012), and this overlap has meant that states, districts, and schools across the country are striving to implement instructional practices and curricula promoting deeper learning and supporting CCSS.

The second is the Race to the Top assessment development competition for states to develop assessments that measure the Common Core standards. As Common Core and its accompanying assessments (Smarter Balanced Assessment Consortium and Partnership for Assessment of Readiness for College and Careers) are being implemented nationally, this will require local districts to incorporate more complex forms of assessment into their instructional and assessment repertoire. Additionally, these reforms require teachers to attend to deeper, student-centered learning practices in their classrooms in order to enable underserved students to bridge national and global opportunity gaps. Deeper learning competencies mean that students master core academic content, think critically, work collaboratively, communicate effectively, and learn how to learn (NRC, 2012)—elements that are not currently measured in the existing accountability system.

While promising, these new initiatives will require tremendous transformation of teaching approaches, school organization, and leadership orientation particularly in schools previously under the threat of being labeled a failing school. Although these percentages have declined significantly, in 2011 25% of African American students and 17%

of Latino students attended high schools labeled as dropout factories, that is a school in which 12th-grade enrollment is 60% or less of 9th-grade enrollment 3 years earlier compared to only 5% of White students (Balfanz, R., Bridgeland, J., Bruce, M., & Fox, J. Hornig, 2013). Schools serving low-income students and students of color have the furthest distance to travel to meet the goals of the Common Core State Standards and corresponding assessments.

To understand how to help schools close the distance between their current practices and outcomes that are consistently preparing all students for college, career, and life, it is crucial that we not only look closely at the school models, structures, and practices that facilitate student-centered learning, but that we also take a wider, systemic perspective that considers how policy, practice, and research intersect to undermine or support student-centered pedagogy. This understanding will be critically important to both the research itself and to its utility to the field. This study increases our understanding of the conditions necessary to narrow that gap by illuminating the conditions necessary to transform the schools serving the growing numbers of low-income students and students of color.

The Study: What is Student-Centered Learning?

The discussion above offers a glimpse into the challenges low-income students of color face in schools today. In an effort to highlight those schools that are disrupting the status quo and engaging students on deeper levels while also exhibiting success in the national accountability system, our research, and that of others (Darling-Hammond, Ancess, & Ort, 2002; Friedlaender & Darling-Hammond, 2007; Wentworth, Kessler, & Darling-Hammond, 2013), demonstrates that a student-centered approach is one such path that can work. Student-centered practice seeks to deepen student learning and a commitment to eliminating the opportunity gap. In this context the bar for student learning is high, and students are supported through pedagogy and curricular choices that are designed to make learning meaningful, relevant, engaging, and responsive to students' needs while preparing them for college and career. Schools that employ student-centered practices emphasize positive and supportive relationships between students and adults in schools, which enable students to persist and succeed in academic environments that are challenging, relevant, collaborative, student-directed, and applied to real-life situations. Research shows that this is the type of setting necessary for students to develop the skills to succeed in college, career, and life (Autor, Levy, & Murnane, 2003; Conley, 2011; NRC, 2011; Rotherham & Willingham, 2009; Scardamalia, Bransford, Kozma, & Quellmalz, 2010). Students are assessed in authentic ways on their deep mastery of knowledge and skills and have multiple opportunities to demonstrate that mastery (Ames & Archer, 1988; Blumenfield, Puro, & Mergendoller, 1992; Eccles & Midgely, 1989). Finally, in student-centered schools, educators are supported in creating a student-centered learning environment through opportunities for reflection, collaboration, and leadership, which in turn leads to not only greater student

engagement and achievement, but also increased teacher efficacy and satisfaction (Bryk, Camburn, & Louis, 1999; Darling-Hammond, Ancess, & Ort, 2002; Lee & Smith, 1997; Little, 1982; McLaughlin & Talbert, 2001).

As illustrated in this report, student-centered practices provide an avenue to narrow the opportunity gap by providing students with access to deeper learning as measured on the new assessments and by preparing students for college, career, and life. Central to student-centered success is the hiring of well-prepared teachers trained in high quality teacher education programs, mentoring opportunities for new teachers, modeling of desired instructional practices, opportunities for focused and coherent professional development, and time for teacher collaboration. Similarly, administrators in these contexts are most successful when supported by charter management organizations or district offices that view their role as a support provider rather than accountability manager and emphasize a focus on instructional quality. Finally, schools that take on such practices need adequate funding to provide additional supports to English language learners and special education students. Collectively these supports provide teachers the capacity to develop curricula, pedagogy, and assessment systems that are personalized, interdisciplinary, relevant, and rigorous.

Learning From Student-Centered Schools That Support Underserved Students

Beyond theoretical notions of what student-centered learning can be, this study sought to document the on-the-ground realities of student-centered practices in schools serving students whose learning needs were not met in their previous schooling, many of whom enter high school far below grade level in their knowledge and skills. Furthermore, because the students' inadequate educational experiences are often coupled with inequities their families face in housing, health care, and employment, many students enter school with the double hurdle of being academically unprepared and not having many of their basic needs met. These confounding inequities can leave students having little faith that life will improve and that they can do anything to shape their destiny. In this study we have sought to unpack successes, challenges, and difficult choices schools have to make to sustain their commitment to a student-centered approach while ensuring that they are truly meeting their students' needs. We also address the supports that educators need to take on a much broader definition of schooling than exists in most high schools in the United States. Finally, the study sought to document the outcomes for students of these schools' student-centered approaches.

The study was guided by the following questions:

1. What are the effects of student-centered learning approaches on student engagement, achievement of knowledge and skills, and attainment (high school graduation, college admission, and college continuation and success), in particular for underserved students?

2. What specific practices, approaches, and contextual factors result in these outcomes?

Investigating Models That Embrace Student-Centered Practices

For this study we examined the nature of student-centered practices in the context of specific school models and in schools that serve many students who had not thrived in their previous school experiences and who faced the ongoing challenges of poverty and inequity. To this end, schools were selected from two signature models of student-centered learning in California: Linked Learning and Envision Education. Both models provide learning experiences that prepare students for college and meaningful careers. Each of the models has developed authentic curricula that connect classroom learning with real-world contexts.

Envision Education

Impact Academy of Arts and Technology in Hayward, California and City Arts and Technology High School in San Francisco are two of three small high schools operated

by Envision Education, a charter school management organization in the Bay Area of California founded in 2002. Envision Education's philosophy is built around a focus on the "four R's" of education: (1) *rigorous* college-prep curricula, (2) strong *relationships* supported through small, personalized learning environments, (3) *relevant* coursework that motivates and supports deep learning, and (4) high academic standards that lead to positive *results*. Furthermore, instruction at Envision Education is designed to support an iterative cycle of learning described as "Know, Do, Reflect," where students build *knowledge* on a topic, actively *demonstrate* their understanding through applied learning opportunities, and *reflect* on what they have learned and how they can continue to improve. Envision Education's schools are nationally recognized for their performance assessment system.

Linked Learning Pathways

Both Life Academy in Oakland, California and Dozier-Libbey Medical High School (Dozier-Libbey) in Antioch, California are part of the Linked Learning Initiative, a statewide district initiative funded by the James Irvine Foundation to support an approach to transforming education by integrating rigorous academics with career-based learning and real-world workplace experiences. Life Academy and Dozier-Libbey have benefitted from their districts' participation in the statewide initiative, gaining access to a wide range of professional development and curricular resources from support provider ConnectEd: The California Center for College and Career. ConnectEd has developed a rigorous certification process for career pathways where Life Academy and Dozier-Libbey are two of the 28 pathways in the state to be certified as of 2013.[1]

Within the Envision and Linked Learning models, schools were selected with strong student outcomes and evidence of well-established student-centered practices.

The study was conducted over the 2011-12 and 2012-13 school years with several intensive site visits to each school during which we conducted 80 interviews with school administrators, teachers, support staff, students, graduates, parents, and community members and conducted nearly 100 observations of classrooms, school events, and teacher collaboration and professional development. We also administered surveys to teachers, current students, and recent graduates in all four schools.[2] Drawing on data from the National Student Clearing House supplemented by teachers through personal contacts with students we tracked student college attendance and persistence. Finally,

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[1]The certification process provides a common standard for guiding pathway implementation and quality. The certification process involves a cycle of continuous improvement and a number of set standards that each school needs to meet. Dozier-Libbey became certified in 2011 and is up for recertification in 2014.

[2] In partnership with the American Institutes for Research (AIR), which was conducting The Study of Deeper Learning Opportunities and Outcomes funded by the William and Flora Hewlett Foundation, we coadministered the teacher and student surveys in Impact Academy and Life Academy where we were both conducting research. Independently, we administered the same survey in City Arts and Tech and Dozier-Libbey. In this report we draw on the comparison sample data from AIR's research. AIR's comparison sample is drawn from demographically similar schools in the same district as its Deeper Learning treatment school. Details of its selection criteria can be found in Appendix A.

we collected student outcome data by analyzing student-level data sets from the districts in which the schools are located in order to compare the outcomes for students relative to those of similar students in the same communities. (See Appendix A for more details about the study methods.)

Schools Supporting Low-Income Students of Color

The schools selected for this study represent a range of approaches to student-centered practices. They share a commitment to prepare low-income students and students of color for college, career, and life. Each of the schools is non-selective in its admissions requirements, as it is open to all students. Table 1 describes each school's size, type, and student populations.

Table 1: Study School Demographics 2012–2013

School Characteristics	City Arts and Technology High School	Dozier-Libbey Medical High School	Impact Academy of Arts and Technology	Life Academy
Type of school	District-approved independent charter	District school engaged in Linked Learning	District-approved independent charter	District school engaged in Linked Learning
District or CMO affiliation	Chartered by San Francisco Unified and operated by Envision Education	Antioch Unified School District	Chartered by Hayward Unified and operated by Envision Education	Oakland Unified School District
Student enrollment	397	639	462	338
% Free/Reduced lunch	70%	48%	59%	99%
% Students of color	92%	78%	90%	98%
African American	18%	16%	17%	7%
Latino	59%	38%	55%	82%
Asian and Pacific Islander	5%	10%	6%	9%
Filipino	5%	9%	4%	1%
English language learner	10%	4%	14%	28%

Source: http://dq.cde.ca.gov/dataquest/

While the schools share a common commitment to preparing all their students for college through a caring, rigorous, and relevant learning experience, they differ in their approaches. These schools differ in ways that reflect their educational philosophies and

foci and are responsive to the particular students and communities that they serve. In this section we briefly describe each school. A thorough description of each school can be found online (https://edpolicy.stanford.edu/publications/pubs/1175) in the respective case studies.

In section four we outline the cross-cutting commonalities across the four schools.

City Arts and Technology High School, San Francisco, CA

City Arts and Technology High School (CAT), a small charter school serving 400 students in Grades 9-12, was founded in 2004, and is operated by Envision Education. It is located high on a hillside in the Excelsior District of San Francisco. CAT shares a beautiful, light-filled building with June Jordan School for Equity, and its hallways are lined with brightly painted murals with themes embracing diversity, civil rights, and community empowerment, as well as posters promoting college attendance and academic success. The Excelsior community where CAT is located is one of the most ethnically diverse neighborhoods in San Francisco, with large Latino and Filipino populations and bordering the Visitacion Valley neighborhood of San Francisco, a predominantly low-income African American community, as well as the Sunnyvale housing project, which has a history of crime and gang violence.

CAT has a strong emphasis on authentic assessments (such as student exhibitions and portfolios), ongoing teacher professional development, grade-level teacher collaboration through weekly "family meetings," quarterly parent-teacher conferences, and expecta-

City Arts and Technology High School

tions that every graduate will complete the necessary coursework to be admitted to the University of California. Among teachers, CAT has a reputation as a place that embraces instructional innovation and that supports professionalism by providing teachers with discretion over class curriculum and content. Student-centered instruction at CAT is about creating opportunities for students to practice skills and get one-on-one guidance, while also helping to keep cross-classroom expectations for students consistent.

Dozier-Libbey Medical High School, Antioch, CA

Dozier-Libbey Medical High School (Dozier-Libbey), an autonomous, stand-alone small school in the Antioch School District, is located on the edge of town amid cow pastures and near several medical centers. Although in their fifth year, the facilities still look brand new—not a smudge on a wall or bit of chipped paint. Dozier-Libbey opened its doors to ninth graders in 2008 and added a grade level each year until it was fully enrolled in 2012. Responding to overcrowding in the district's two high schools, the superintendent at that time saw an opportunity to open a different kind of school—one with a career focus. In meetings with community leaders and business people on labor force needs, it became evident that the health care field would have the highest employment opportunities. It has been certified as a Linked Learning career pathway.

Dozier-Libbey uses student-centered, experiential education to make learning relevant. Dozier-Libbey integrates health and health care issues across its curriculum through interdisciplinary projects and work-based experiences outside of the classroom. Dozier-Libbey has more independence than is common among district schools and, as a result, has been able to create its own vision for teaching and learning and, for the most part, shape how it implements its vision. Student-centered instruction at Dozier-Libbey is about creating authentic and rigorous experiences for students. Central to Dozier-Libbey orientation to student-centered learning is its commitment to mastery by offering students multiple opportunities to demonstrate their learning in ways that correspond to students' strengths. Believing in the potential of every student has enabled the principal and staff to create a culture of caring and respect between and among teachers and students.

Impact Academy for Technology and Arts, Hayward, CA

Located in Hayward, California, Impact Academy of Arts and Technology is operated by Envision Education. It prides itself in using project-based teaching to foster strong academic growth and deep, meaningful learning experiences for its students. Serving approximately 460 students in Grades 9-12, Impact offers a college preparatory curriculum with a focus on arts and technology. The school resides close to the 880 freeway in a working-class neighborhood with a large Latino population. The facility itself is past its prime, with low ceilings and dim hallway lights. The classrooms are small and filled with furniture that has withstood heavy use, and a fourth of the school's classrooms are located outside in the yard in portable bungalows replete with metal ramps and steps and sterile, off-white colored walls. That said, the staff have installed a plethora of college pendants, pictures, encouraging posters and inspiring quotes along the hallway

walls as a way to portray a sense of welcome and high spirits despite what appears to be a somewhat bleak physical space.

With a distinct focus on personalization and individualization based on student interest and engagement, Impact stands out as a unique learning environment when compared to neighboring comprehensive high schools. Impact faculty describe the Envision Education model as a bridge of sorts, linking traditional content areas with non-traditional ways of schooling. Using common subject areas (math, English, science, social studies, art, and Spanish) married with the school's five core competencies (research, analysis, creative expression, inquiry, and workplace learning), Impact deliberately steps away from relying on antiquated ways of delivering instruction and assessing learning. There is a universal culture of family and community evident on the Impact campus. Teachers and students alike rely upon close relationships as a means of encouragement and motivation for the hard work that is required for all members of the school community to achieve positive outcomes for students.

Life Academy, Oakland, CA

Life Academy is located in the East Oakland neighborhood of Fruitvale, a neighborhood comprised predominately of Latino residents. Opened in 2001, Life Academy is a small public high school in the Oakland Unified School District (OUSD) that weaves a student-centeredness into nearly every aspect of its work and culture. Its goal is to prepare its 340 students to become future health professionals within the biological sciences, and among all Oakland public high schools, Life Academy has the second highest college-going rate to 4-year public universities and the highest percentage of graduates who meet the eligibility requirements for California's public universities, despite 99% of its students living in poverty.[3] It has been certified as a Linked Learning career pathway.

The school's focus on students is evidenced through its deep and institutionalized commitment to fostering relationships between adults and students, college and career preparation coursework, inquiry-based pedagogy, health/science career internships for every 11th- and 12th-grade student, a 4-year advisory program, multiple performance-based exhibitions that include an interdisciplinary and scholarly senior exhibition, and a wide array of student interest-driven "post-session" classes during the final 2 weeks of the year. All of these structures and practices orient the entire school to be responsive to students' needs, interests, and contexts, and to believe in their potential for success. Life Academy's focus on students drives every decision: what and how to teach authentically, what structures will equip students and teachers to know and believe in each other, and how to bring out the best of the students and their community.

[3] Correspondence with Kevin Schmidke, Data Analyst, Oakland Unified School District, November 13, 2013.

Closing the Opportunity Gap

Each of the study schools holds a deep commitment to prepare students for college, career, and life, and has implemented practices toward that end. Analysis of outcomes for students at each of these schools confirms that they are outperforming most other schools in their respective communities that are serving similar populations, especially in supporting the success of African American, Latino, low-income students and English language learners. This is evident through analysis of graduation, student achievement, and college preparatory course completion data as well as college persistence data and surveys of graduates. These data are compared to district and state data.

Students at Impact Academy

Graduating More Students

The study schools are coming close to achieving their common mission, which is to give all their students access to a college education. Table 2 on page 13 provides a detailed account of graduation rates at the study schools, illustrating that students of color and low-income students are graduating from high school at rates higher than district and state averages. Particularly noteworthy is the high graduation rate for African American students at Dozier-Libbey and Impact Academy: 90-95% of African American

students at these schools graduate, compared to district and state averages of about 66%. The graduation rate for Latino students, English learners, and economically disadvantaged students is also high for three of four schools, ranging from 10 to 24 percent higher than state averages for these populations at City Arts and Tech, Dozier-Libbey, and Impact Academy. Although the graduation rate at Life Academy is lower than state averages, it is considerably higher than district averages.

Table 2: Cohort Graduation Rate Class of 2012

Graduation rates	Types of students	CAT	District	Dozier-Libbey	District	Impact Academy	District	Life Academy	District	State
Cohort graduation rate for class of 2012	All	85%	82%	94%	74%	92%	71%	71%	59%	79%
	African Am.	84%	71%	95%	65%	90%	64%	n/a	53%	66%
	Latino	85%	67%	94%	76%	88%	67%	68%	52%	74%
	English learners	84%	68%	100%	65%	83%	57%	50%	46%	62%
	Economically disadvantaged	87%	80%	95%	70%	94%	69%	71%	58%	73%

Source: Data from http://dq.cde.ca.gov/dataquest/

Outperforming Peers on State Assessments

These high graduation rates also impact between-school comparisons of student achievement gains. In many high schools, students who struggle give up and drop out and may even be encouraged to do so by disciplinary actions or counseling out. When lower-achieving students leave high school, it has the perverse effect of boosting the school's average achievement scores, as a number of lower scores disappear from the equation. In the case of the case study schools, however, higher graduation rates for students who often started high school behind many of their peers were also accompanied by greater achievement gains overall and for vulnerable groups of students in particular.

To estimate the effects of the student-centered schools on student achievement, we used data from two sets of standardized tests: the California Star Tests (CSTs) in English Language Arts (ELA), and the California High School Exit Exam (CAHSEE) in ELA and mathematics. We did not analyze CST mathematics scores, since the end-of-course tests taken by students differ based on the specific mathematics subject they pursue (e.g., Algebra I, Geometry, etc.), and the sequence of courses is not identical across students or schools, therefore gain scores cannot be interpreted in a comparable way.

Data for student achievement in Grades 8-11 were assembled from each of the school districts in which the schools are located and from our sample schools: Dozier-Libbey Medical High School, Life Academy, and Impact Academy.[4]

[4] We found that City Arts and Technology High School did not have a data set that was sufficiently complete to conduct longitudinal analyses of student achievement, so it is not included in these analyses.

Adding value to student learning

To analyze the data, we used a "school productivity" analysis. This method provides estimates of the value added to student learning by a school after taking into account differences among the student populations. Although each of the student-centered schools is non-selective in its admissions, residential patterns and the nature of school choice options produce noticeable differences in school populations. For example, the proportion of students at Life Academy whose parents have not attended college is around 23 percentage points higher than the average of all other schools in the district. Our analysis takes into account a range of student-level background characteristics that can influence student learning. It examines individual student level data, rather than school cohort data, in order to answer the question of how much an individual student—and the collection of students—in each of our target schools learned relative to students with like characteristics in other district schools.

Productivity analysis uses multiple regression techniques to estimate the projected student achievement levels for students in a school district after accounting for student characteristics. This projected achievement is then compared with the actual achievement of pupils in each of the district schools. The difference between the actual and projected achievement levels provides the estimate of a school's productivity, or the average value added to student learning by the school as measured by a given test. As different tests assess different capabilities, this approach was applied to scores on the CST (ELA) and CAHSEE (ELA and math).

CST ELA tests are taken by students annually in each grade, and all students in a given grade level take the same test. As the tests do not use a comparable scale across grades, we converted CST scale scores to standardized units (known as z-scores) to enable comparability.[5] Eighth-grade CST scores were used as a baseline for prior learning. We then used two statistical models to estimate productivity. The first predicted CST ELA scores in ninth through 11th grades,[6] adjusting for the difficulty of the test at each grade level and for prior achievement in the previous year. The second model examined outcomes on the 10th-grade CAHSEE exam (the year in which all students take the CAHSEE) for ELA and mathematics.

The statistical models accounted for a range of student-level background characteristics commonly associated with variations in student achievement.[7] A "same student" cohort was also used to help isolate the effects due to participation in the student-centered schools, meaning that students transferring into a school later than ninth grade were not included in the cohort for analysis.

[5] Z-scores are standard units where a distribution is normalized to give a mean of 0 and a standard deviation of 1. The z-score thus represents the number of standard deviation units from a population mean.

[6] Due to availability of data, the model for Impact Academy included data only as far as 10th grade.

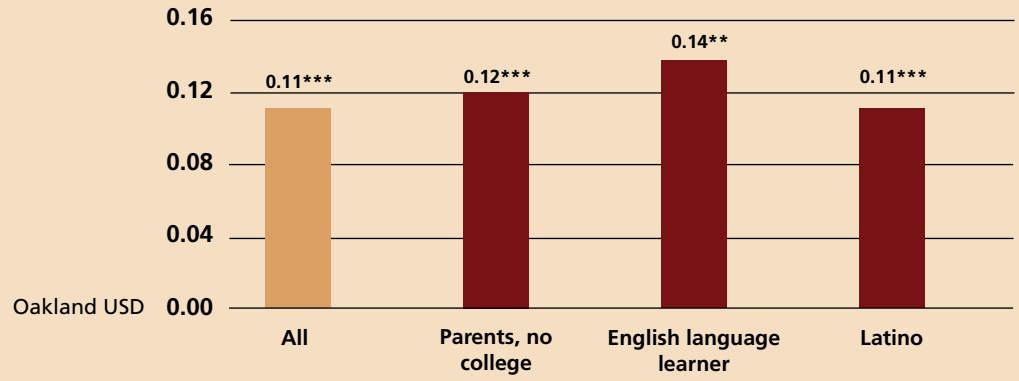
[7] The list of variables used in each regression is shown in Appendix A.

The models showed that around 68% to 70% of the variation in student achievement on ELA was explained by a combination of prior learning and the student-level characteristics above. On the CAHSEE, about 66% to 70% of the variation was explained in ELA and about 57% to 65% was explained in math.[8] Details of the statistical models are available in Appendix A.

The results from the first model (using CST data) are displayed in Figures 1-3. Achievement data for each of the schools were adjusted (using z-scores) so that the mean district level is set at zero. A positive number therefore represents the estimated productivity—or value added to student achievement—associated with attendance at the school relative to that of similar students attending other district schools, after accounting for students' prior test scores and other student-level attributes.[9]

The positive findings shown in Figures 1-3 indicate that each of the three student-centered schools was on average associated with a greater level of value added to student learning in English language arts relative to other district schools. The average added value associated with the student-centered schools ranged from 0.10 to 0.18 standard units. These effects were greater for some traditionally underserved learners. For example, for students whose parents had not attended college, and those enrolled in free or reduced lunch programs, the added productivity associated with the school ranged from 0.10 to 0.23 units relative to that of other students in their districts.

FIGURE 1: VALUE ADDED TO STUDENT ACHIEVEMENT: LIFE ACADEMY IN COMPARISON TO OAKLAND UNIFIED SCHOOL DISTRICT (CST ELA)



[8] The adjusted-R^2, an indication of the degree of 'fit' of the model, ranged from 0.679 to 0.705 for CST ELA, from 0.660 to 0.703 for CAHSEE ELA, and from 0.573 to 0.646 for CAHSEE mathematics.

[9] The presence of one, two, or three asterisks represents statistical confidence at the 95, 99, and 99.9% levels, respectively.

FIGURE 2: VALUE ADDED TO STUDENT ACHIEVEMENT: DOZIER-LIBBEY HIGH IN COMPARISON TO ANTIOCH UNIFIED SCHOOL DISTRICT (CST ELA)

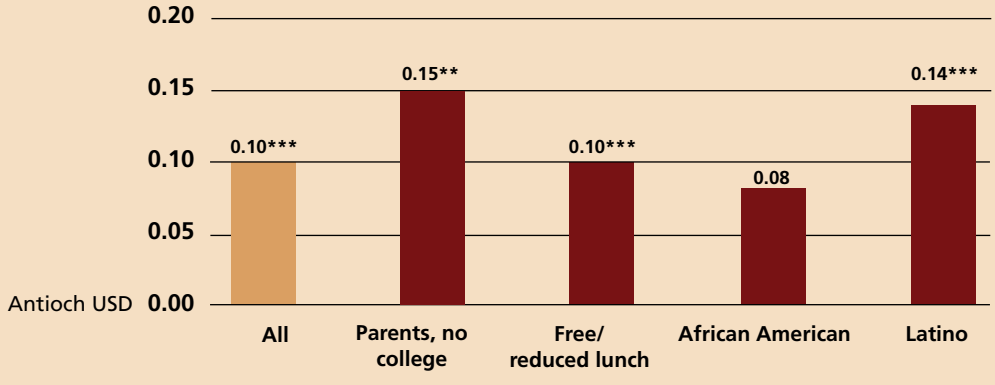
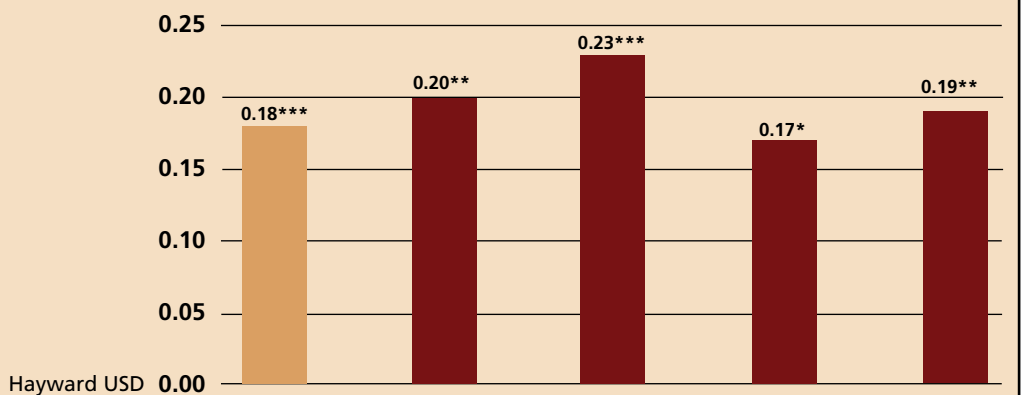


FIGURE 3: VALUE ADDED TO STUDENT ACHIEVEMENT: IMPACT ACADEMY IN COMPARISON TO HAYWARD UNIFIED SCHOOL DISTRICT (CST ELA)



Even stronger results were found for CAHSEE scores for ELA and mathematics. In this case, eighth-grade CST scores were used as a baseline (see Figures 4-6, pages 17–18). Overall, productivity coefficients associated with the student-centered schools ranged from 0.08 to 0.19 standard units in ELA, and from 0.13 to 0.30 in mathematics. Even higher levels of added value were found for socioeconomically disadvantaged students and those whose parents had not attended college, each with productivity scores as high as 0.21 units in ELA and 0.33 units in mathematics. For African American students at Impact Academy in mathematics, the coefficient reaches 0.40.

FIGURE 4: VALUE ADDED TO STUDENT ACHIEVEMENT: LIFE ACADEMY IN COMPARISON TO OAKLAND UNIFIED SCHOOL DISTRICT (CAHSEE)

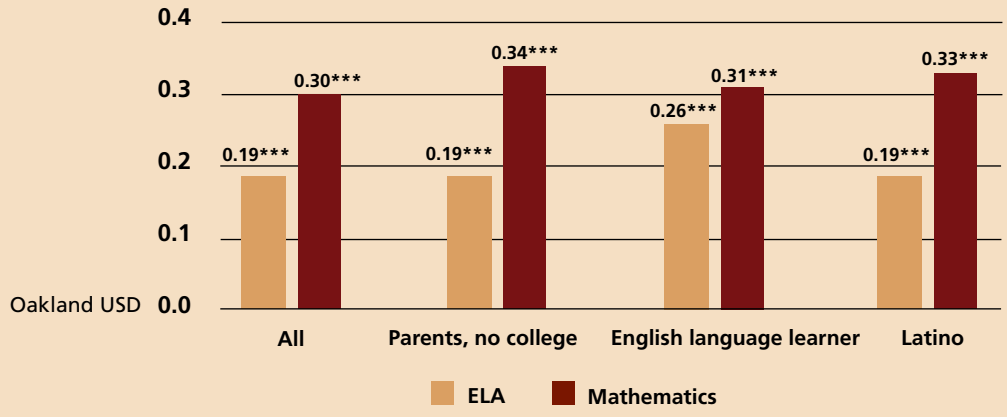
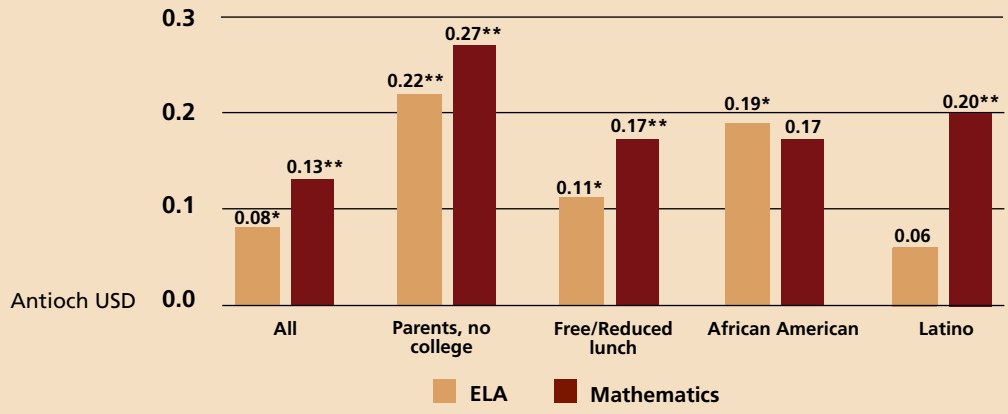


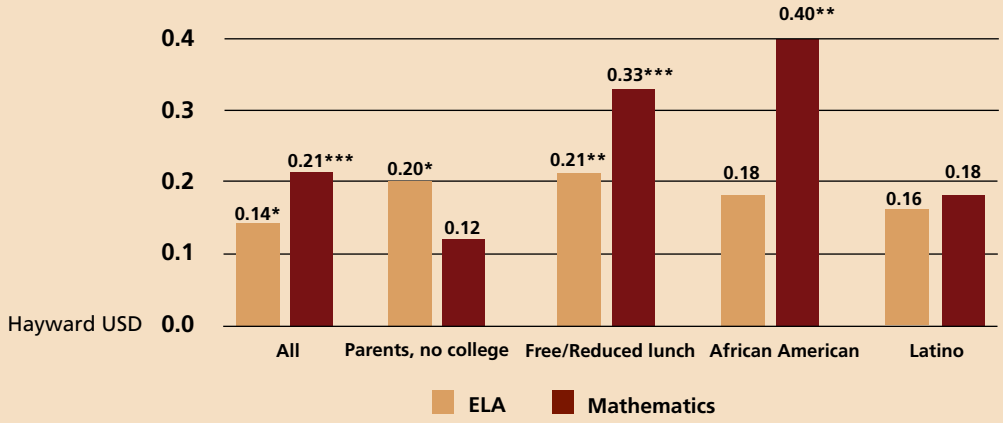
FIGURE 5: VALUE ADDED TO STUDENT ACHIEVEMENT: DOZIER-LIBBEY HIGH IN COMPARISON TO ANTIOCH UNIFIED SCHOOL DISTRICT (CAHSEE)



How large are these effects? There is no simple method for converting standard units to scale scores, given that the scale scores between grades are not directly comparable. In approximate terms, however, a z-score of 0.2 is roughly equivalent to an increase of 8 percentage points in mean student achievement (that is, a movement from the 50th to the 58th percentile) relative to that of students at all other schools in the district.[10]

[10] The percentage point gain will be smaller for students initially located further from the mean.

FIGURE 6: VALUE ADDED TO STUDENT ACHIEVEMENT: IMPACT ACADEMY IN COMPARISON TO HAYWARD UNIFIED SCHOOL DISTRICT (CAHSEE)



Another way to examine relative learning gains is to compare the productivity statistics for all district schools, as we illustrate below. How do student-centered schools compare with other schools in their district, examined individually? We used the same statistical model to calculate the mean productivity on CAHSEE—the difference between actual and projected CAHSEE scores in both ELA and math—for each of the schools within a district. Schools' mean productivity levels were then plotted for Oakland, Antioch, and Hayward school districts on axes of ELA versus mathematics (see Figures 7–9). Each axis measures the value added in standard units, and each dot on the graph represents a school. A positive score in the horizontal or vertical directions indicates that on average students in a school are achieving in mathematics or ELA respectively at a level greater than that projected by the model.

FIGURE 7: VALUE ADDED TO STUDENT ACHIEVEMENT: LIFE ACADEMY IN COMPARISON TO OAKLAND USD SCHOOLS (CAHSEE)

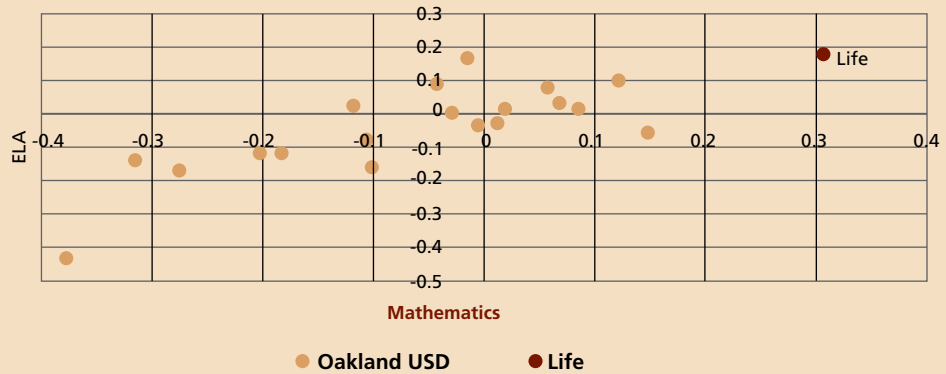


FIGURE 8: VALUE ADDED TO STUDENT ACHIEVEMENT: DOZIER-LIBBEY HIGH IN COMPARISON TO ANTIOCH USD SCHOOLS (CAHSEE)

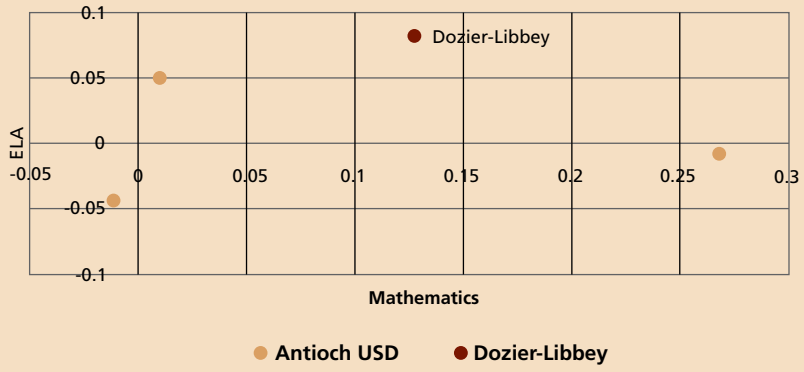
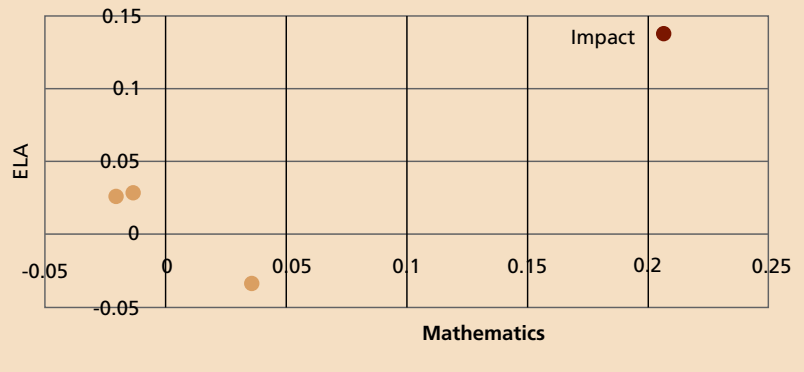


FIGURE 9: VALUE ADDED TO STUDENT ACHIEVEMENT: IMPACT ACADEMY IN COMPARISON TO HAYWARD USD SCHOOLS (CAHSEE)



The findings show that in each case the student-centered school is located in the upper right quadrant, indicating that the school is associated with added value to student learning on both CAHSEE ELA and mathematics. The positioning of the dots for student-centered schools farther along the horizontal axis for two of the three sample schools and along the vertical axis for all three schools shows that all of these schools were associated with higher value added on CAHSEE ELA, and two of the three were associated with higher value added on CAHSEE mathematics than any other high schools within their district after accounting for student characteristics and prior learning.[11]

[11] Findings for six schools from Oakland, four from Antioch, and two from Hayward do not appear in the charts due to small sample size—fewer than 25 cases—and hence lack of reliability regarding the accuracy of the data points.

Using the same regression models as above, we were also able to investigate the proportion of students from each student-centered school cohort whose actual achievement was higher than that predicted by its prior achievement and individual characteristics—an indication of value added to student learning by the school. Tables 3–5 show the proportion of students exceeding projected achievement for each school, the same statistic for the mean of all other schools in the same district, and the associated *p* value.[12]

We found that on average 66% to 75% of students in the student-centered schools achieved at higher than predicted levels for the CST ELA model, a result that was statistically significant for all three schools. On the CAHSEE, the proportion of students achieving at higher levels than predicted by the statistical model ranged from 56% to 63% for mathematics and from 56% to 68% for ELA. The *p* values show that these results were statistically significant at the 99% level for each school in CST ELA and CAHSEE mathematics and for one school (Life Academy) in CAHSEE ELA, and significant at the 93% confidence level for the other two schools in CAHSEE ELA. Together, these data suggested that the majority of students attending student-centered schools were more likely to exceed projected levels of achievement when compared to similar students within the same district.

Table 3: Percentage of Students Exceeding Projected Achievement (Life Academy)

Productivity model	Life Academy	Oakland USD	*p* value
CST ELA (8th–11th grades)	70.9%	50.6%	0.0000
CAHSEE ELA (8th–10th grades)	68.1%	49.2%	0.0000
CAHSEE Math (8th–10th grades)	63.1%	48.7%	0.0004

Table 4: Percentage of Students Exceeding Projected Achievement (Dozier-Libbey High)

Productivity model	Dozier-Libbey High	Antioch USD	*p* value
CST ELA (8th–11th grades)	66.3%	50.3%	0.0000
CAHSEE ELA (8th–10th grades)	56.3%	50.5%	0.0793
CAHSEE Math (8th–10th grades)	56.3%	46.7%	0.0036

Table 5: Percentage of Students Exceeding Projected Achievement (Impact Academy)

Productivity model	Impact Academy	Hayward USD	*p* value
CST ELA (8th–11th grades)	74.6%	52.3%	0.0000
CAHSEE ELA (8th–10th grades)	57.3%	48.8%	0.0711
CAHSEE Math (8th–10th grades)	60.7%	48.3%	0.0084

[12] The *p* value results from a chi-squared test for the statistical significance of the difference between the school and district means. *P* values less than 0.05, 0.01, and 0.001 are associated with a 95, 99, or 99.9% level of statistical confidence, respectively.

Conclusions from student achievement results

These analyses offer one way of assessing the effectiveness of the student-centered schools. Taken together, the above findings contribute evidence to suggest that student-centered schools are influential in accelerating student achievement. The productivity analyses showed that students in these schools were on average associated with greater achievement gains than projected after taking into account prior learning and their individual characteristics. The achievement gains were often largest for some traditionally underserved populations, indicating that student-centered schools may help narrow achievement gaps for these groups.

These analyses have some limitations. The methods assess relative student achievement within a district, and not comparative achievement between districts. Our methods were also restricted to estimating the influence of schools on learning as measured by the CST and CAHSEE tests. They do not capture the full range of higher order competencies that may be generated through the deeper learning experiences associated with each of these schools. Students' accomplishments on analytic and performance tasks, including their capacities to investigate, develop solutions, collaborate, exercise leadership, write and speak effectively, and use technologies are more explicitly developed in these schools than in most other high schools and are evaluated in these schools' performance assessments, which we describe in a later section on school practices.

Although our analyses are associative and not causal, the findings are consistent with other evidence presented in this report. The increased value added to student achievement on state tests, particularly for disadvantaged learners, and the greater proportion of students exceeding expected levels of achievement are logically related to the greater level of support students experience in their learning, and the fact that teachers in these student-centered schools feel more able to overcome challenges to student learning.

Preparing Students for College

High school graduation rates and achievement on standardized tests that exceed district and state averages provide powerful evidence of the effectiveness of a student-centered approach. However, these schools strive to do more than prepare students for high school graduation; they seek to open the doors to college and provide students with the tools they need to persist in college. The state college system in California provides the most financially accessible opportunity for low-income students, although it is increasingly unaffordable. Key to gaining access to the California state system is completion of required college preparatory courses in high school that include four years of English, three years of math, two years of lab science, and foreign language and arts course requirements. These course requirements are called a-g courses. (See Appendix B for these requirements.)

Statewide there are sizeable gaps between a-g completion rates of low-income students and students of color and those of White and Asian students. Statewide, 45% of White

and 68% of Asian students complete these requirements compared to 29% of African American, 28% of Latino, and 30% of low-income students.[13] The student-centered schools in this study, by structuring their course offerings—and in some cases their graduation requirements—to be compliant with the a-g requirements, are dramatically overcoming this statewide gap for their students. Table 6 provides an overview of each of the schools' California college course completion rates. At City Arts and Tech, Dozier-Libbey, and Impact Academy, 96–100% of students have completed the California college course requirements. Life Academy, while having somewhat lower rates than the other three schools, serves a higher-need student population than the others and won recognition from its district for having the highest a-g completion rates of any high school in the district.

Table 6: College Preparatory Course Completion Rates (2011–12)

Graduation rates	Types of students	CAT	District	Dozier-Libbey	District	Impact Academy	District	Life Academy*	District	State
Percent of graduates completing all courses required for UC/CSU admission	All	99%	56%	96%	24%	100%	44%	87%	51%	38%
	African American	100%	28%	94%	15%	100%	34%	100%	34%	29%
	Latino	100%	36%	100%	15%	100%	39%	82%	54%	28%
	Limited English proficient	100%	38%	92%	24%	100%	34%	n/a	46%	23%
	Socioeconomically disadvantaged	100%	54%	95%	22%	100%	45%	n/a	48%	30%

Source: Data for all sources except Life Academy from http://dq.cde.ca.gov/dataquest/
**Life Academy data from Oakland Unified School District*

Persisting in College

Across the United States, high schools seek to prepare students to get into college, but not necessarily to stay and graduate from college. The student-centered schools in this study, however, have designed their curriculum purposefully to provide students the kinds of academic skills they need to do college-level academic work, have the fortitude to persist through challenges, and be successful in their careers as well.

Students in the study schools attend college above state and national rates, particularly given the populations they serve. Table 7 on page 23 indicates the high school graduates' postsecondary enrollment rates.

[13] Data from http://dq.cde.ca.gov/dataquest/

Table 7: High School Graduates' Higher Education Enrollment Rates Class of 2012

High School Graduates Postsecondary Enrollment Rates	City Arts and Technology	Dozier-Libbey Medical High School	Impact Academy	Life Academy
% of high school graduates enrolling in a postsecondary institution (2-year/4-year college or career tech training program)	86%	93%	78%	64%

Source: National Student Clearinghouse http://www.studentclearinghouse.org/about/
Data is supplemented through personal contacts with students themselves and former teachers of the students who know of their whereabouts.

The vast majority of 2012 graduates from the study schools enroll in California public universities, from 80% at Impact and CAT, 86% at Dozier-Libbey, and 97% at Life Academy. The study schools' college enrollment rates exceed the state averages, although direct year-to-year comparisons are not possible because the most recent state data are from 2009. For California public high school graduates for the class of 2009, 41% of all graduates, 36% of African American graduates, and 39% of Latino graduates enrolled in a California public community college, California State University, or in the University of California. The study schools enrollment rates are comparable to national enrollment rates for the highest income U.S. students. For the class of 2012, 82% of students from the highest income families enrolled in college compared to 52% of students from the lowest-income quintile (Baum, Ma, & Payea, 2013). Study schools, which serve predominately Latino and African American students, exceed national rates. Nationally, for the class of 2011, 66% of African American, 62% of Latino, and 70% of White students enrolled in college within a year of completing high school (Baum, Ma & Payea, 2013).

In the study schools, many students, from 46%–65% of graduates, enrolled in a four-year college, mostly within the California state college system. These rates are roughly comparable to the national average for the class of 2007 of 64% of students enrolling in a four-year college, despite that the study schools serve more low-income students and students who are the first in their family to go to college than the national average (Shapiro, Dundar, Ziskin, Yuan, & Harrell, 2013). Table 8 on page 24 displays college enrollment rates in the study schools.

Beyond enrolling in college, the quality of students' high school preparation influences their persistence rate in college. Of course other factors, such as their ability to finance their college education and their family's needs for them to contribute to the household income, contribute as well.

Initial enrollment and continuing enrollment for each graduate were obtained through the National Student Clearinghouse (NSC), which provides college enrollment information to secondary schools and districts that subscribe to their service. The NSC gathers registration information for most colleges that register and cooperate with the

Table 8: High School Graduates' College Enrollment Rates Class of 2012

Types of postsecondary college rates	City Arts and Technology	Dozier-Libbey Medical High School	Impact Academy	Life Academy
% of graduates with postsecondary enrollment who enroll in a 2-year institution (public and private)	46%	52%	34%	35%
% of graduates with postsecondary enrollment who enroll in a 4-year institution (public and private)	53%	46%	64%	65%
% of graduates with postsecondary enrollment who enroll in career tech training programs	1%	2%	2%	0%

Source: National Student Clearinghouse http://www.studentclearinghouse.org/about/
Data is supplemented through personal contacts with students themselves, and former teachers of the students who know of their whereabouts.

NSC. However, there are sometimes errors in the information provided to the NSC, and the NSC does not include all local postsecondary vocational programs or the military. Therefore, we had to supplement the NSC data through follow-up with individual graduates who were not present in the NSC databases. Through this supplementary information gathered with the help of school staff, we were able to obtain fairly complete initial postsecondary enrollment rates. It was more difficult to supplement information about the continuing enrollment of graduates once they were past their first year of college. While our sources of data provided information about most graduates from our four case study schools, we cannot say with confidence that it is 100% accurate, especially past the first year out of high school.

Since at the time of the study Dozier-Libbey's first graduating class was in its first year of college and Impact Academy's first graduating class was in its second year of college, there is limited data on their students' persistence in college. Of the Impact graduates who enrolled in college, 66% persisted to a second year of college. Among Impact graduates, students who enrolled in four-year colleges were more likely to persist through the second year of college than students who enrolled in two-year colleges (81% and 42%, respectively).

The considerably higher persistence rates in four-year versus two-year colleges hold true for CAT and Life graduates as well and correspond with national trends. This may be because of the academic, social, and economic supports in place at four-year colleges. Table 9 on page 25 details the number and percent of students from CAT and Life Academy who had continuous enrollment in one or more two-year colleges following their graduation from college. The data, derived from the National College Clearinghouse, track enrollment but not graduation rates, so it is impossible to know what percentage of students enrolled in a two-year college in fact graduated. Although the community

Table 9: College Persistence in Two-year Colleges for CAT and Life Graduates[14]

Years of college enrollment	Graduating Class of 2008 Number (percentage) of graduates	Graduating Class of 2009 Number (percentage) of graduates		Graduating Class of 2010 Number (percentage) of graduates		Graduating Class of 2011 Number (percentage) of graduates	
	CAT	CAT	Life	CAT	Life	CAT	Life
5 years of enrollment	8 (42%)	--	--	--	--	--	--
4 years of enrollment	1 (5%)	8 (57%)	7 (44%)	--	--	--	--
3 years of enrollment without continuation to the 4th year	2 (11%)	1 (7%)	3 (19%)	6 (55%)	12 (55%)	--	--
2 years of enrollment without continuation to the 3rd year	2 (11%)	1 (7%)	4 (25%)	1 (9%)	5 (23%)	21 (66%)	10 (77%)
1 year or less of enrollment without continuation to the 2nd year	6 (32%)	4 (29%)	2 (13%)	4 (36%)	5 (23%)	11 (34%)	3 (23%)
Total	19	14	16	11	22	32	13

[14] Not included in this table are one 2008 CAT graduate and one 2011 CAT graduate who transferred from a two-year college to a training program.

colleges are referred to as two-year colleges, students often take three to four years to complete them. The data indicate that between 13% and 34% of students did not persist to a second year of their two-year program depending upon the school and cohort graduation year.

In contrast, persistence rates in four-year institutions for CAT and Life graduates are much higher. Table 10 on page 26 details the continuous enrollment of high school graduates from CAT and Life Academy in a four-year institution. Among the graduating classes of 2009 from CAT and Life Academy, 97% and 69% were still enrolled in their fourth year of college, respectively.

Transferring into a four-year college from a community college appears to be beneficial to students as well, as nearly all persisted into fourth and fifth years of college enrollment. For example, all four 2009 CAT graduates and all three 2009 Life graduates who transferred from a two-year to a four-year college had continuous enrollment for four years. The high persistence rates in four-year colleges are particularly good news for CAT and Life Academy as the majority, 53% and 65%, respectively, enrolled in such institutions.

Table 10: College Persistence in Four-year Colleges for CAT and Life Academy Graduates[15]

Years of Enrollment	Graduating Class of 2008 Number (percentage) of graduates	Graduating Class of 2009 Number (percentage) of graduates		Graduating Class of 2010 Number (percentage) of graduates		Graduating Class of 2011 Number (percentage) of graduates	
	CAT	CAT	Life	CAT	Life	CAT	Life
5 years of continuous enrollment	12 (44%)	--	--	--	--	--	--
4 years of continuous enrollment	10 (37%)	30 (97%)	9 (69%)	--	--	--	--
3 years of enrollment without continuation to the 4th year	2 (7%)	1 (3%)	1 (8%)	17 (74%)	10 (91%)	--	--
2 years of enrollment without continuation to the 3rd year	0 (0%)	0 (0%)	0 (0.0%)	1 (4%)	0 (0%)	24 (73%)	11 (85%)
1 year or less of enrollment without continuation to the 2nd year	3 (11%)	0 (0%)	3 (23%)	5 (22%)	1 (9%)	9 (27%)	2 (15%)
Total	27	31	13	23	11	33	13

Although it is difficult to compare this college persistence data with national averages as those data are configured differently, CAT and Life graduates who enroll in college persist in college comparably to or better than national averages. For example, based on the most recent data from the National Center for Education Statistics, among the class of 2006 nationally, 71% of all students, 62% of African American students, and 64% of Latino students who enrolled in a four-year college graduate or are still enrolled three years after initial enrollment, which compares to 100% of CAT students and 77% of Life students from the class of 2009 who graduate or are still enrolled after three years after enrolling in a four-year college.[16] This is particularly noteworthy given that 73% of CAT students and 99% of Life Academy students are also low-income.

Student-centered high school practices support college persistence

Beyond providing students with access to the required courses to be eligible for the California public college system, the study schools designed their instruction purposefully to prepare their graduates for college success. To better understand how students' high school experiences prepared them to persist in college, we surveyed graduates from all four case study schools. Although the sample is small, it does provide anecdotal evidence

[15] Not included in this chart are the following graduates who transferred from four-year to two-year colleges: eight 2008 CAT graduates, eight 2009 CAT graduates, three 2009 Life graduates, three 2010 CAT graduates, five 2010 Life Graduates, ten 2011 CAT graduates, and three 2011 Life graduates.

[16] Data generated by NCES QuickStats from Beginning Postsecondary Students 2009 http://nces.ed.gov/datalab/quickstats/createtable.aspx

of the kinds of high school experiences that were most beneficial and how prepared students felt when they entered college.[17]

Students cited a host of high school experiences that contributed to their college readiness. Across all four schools the most helpful experiences involved relationship building, high standards, deep learning, and instructional relevance. Table 11 on page 28 shows the experiences that were top influences across multiple schools. The highest percentage of students indicated that being required to "explain their thinking" was very helpful or helpful to them being fully prepared for college.

Across the four schools surveyed graduates felt, for the most part, prepared for college and that they could manage college life with confidence and independence. Table 12 on page 28 indicates that at least two thirds of graduates who entered college found it less challenging or about as challenging as they expected.

Although highly variable, most graduates felt academically prepared: 51% of Life graduates, 65% of CAT graduates, 95% of Impact Academy graduates, and 96% of Dozier-Libbey graduates. The areas in which students felt most prepared correspond directly to the types of high school experiences that they found most helpful. Surveyed graduates felt extremely prepared for the following ways of working in college: working effectively with others (74%), speaking or presenting in public (65%), speaking clearly and effectively (63%), thinking critically and analytically (63%), but less prepared to analyze math or quantitative problems (35%).

Students at Dozier-Libbey

[17] 170 graduates were surveyed for a response rate of 21%.

Table 11: High School Experiences that Most Contributed to Students' Perception of College Readiness

High school experiences that were helpful or very helpful to students' feeling prepared for college-level work	4-school average (N=195)	CAT (N=38)	Dozier-Libbey (N=62)	Impact (N=33)	Life Academy (N=62)
Explaining my thinking	92%	97%	87%	95%	93%
Relationships with teachers and advisors	91%	87%	91%	90%	93%
Having to revise my work until it met standards of proficiency	91%	100%	83%	90%	93%
English courses	91%	83%	96%	95%	88%
Testing or trying out ideas to see if they worked	91%	84%	91%	95%	93%
Pursuing topics that interested me	91%	97%	89%	100%	85%
Working with other students on projects	90%	83%	96%	95%	83%
Preparing and giving presentations	90%	97%	87%	90%	88%
Choosing my own topics for projects, presentations, and assignments	90%	94%	89%	90%	88%
Discussing my point of view about something I had read	88%	87%	87%	95%	88%
Trying to find answers on my own before the teacher answered my questions	88%	87%	85%	81%	95%
Thinking about how I learn best	88%	87%	87%	100%	83%
Projects and major assignments	87%	87%	87%	90%	88%

Table 12: Level of Challenge in College for Study School Graduates

During their first year of college, students found their classes to be . . .	CAT (N=38)	Dozier-Libbey (N=62)	Impact (N=33)	Life (N=62)
Less challenging than expected	31%	34%	35%	19%
As challenging as expected	38%	47%	45%	47%
More challenging than expected	31%	19%	20%	34%

Graduates' experiences in highly personalized and supportive high school environments taught them to seek help when they needed extra academic support. Although the majority of students do feel confident and well prepared for college-level work, they also know to seek out supports when they need help. Sixty-eight percent of surveyed students reported drawing on college academic support resources such as tutors, study groups, writing workshops, mentoring, and academic advising.

Summary

There is no greater measure of the success of a high school than its ability to successfully graduate students and to prepare those students to succeed in college and careers. By this measure, the study schools are remarkably successful. They graduate low-income students and students of color at a much higher rate than do other schools in their districts or state; they disrupt the predictable nature of race, class, and language proficiency in students' performance on standardized tests; and they send a much higher percentage of these students to college. Once these students make it to college, they persist at rates similar to or higher than other students, despite their relative disadvantage. As will be discussed further in the next section, the success of these schools can be attributed to the attention they pay to the whole student, working to develop the cognitive and non-cognitive skills students need to succeed in college. These include qualities such as persistence, time management, and the willingness to look for and get help when needed.

School Practices That Promote Student Success

A key focus of this study is to unpack the components of student-centered practices and more fully understand the on-the-ground realities of how they play out in schools with students typically underserved by the educational system. In this section we describe the student-centered practices in the schools as well as the challenges entailed in implementing a student-centered approach.

Despite their different approaches, all four schools have many characteristics in common as well. A defining characteristic of each study school is an unrelenting belief that every student has the potential to achieve high academic standards and to attend college. Though each school has developed its own unique educational culture and set of practices to support student success, they share a willingness to innovate and to shift their approach as needed in order to meet students where they are and to move them toward mastery. In their own distinctive ways, they each

- support students' social and emotional skills so that they persist when faced with obstacles;
- ensure that students are academically prepared for college and career;
- provide additional academic support for students who need it;
- and empower educators to innovate and use a student-centered approach.

In this section, we provide a broad overview of the distinct strategies and practices that the schools use to achieve these aims, including formal structures to support caring relationships between students and teachers as well as informal outreach by teachers to ensure that no child slips through the cracks. Through hands-on, group-oriented learning experience and relevant curricula, the schools make learning accessible. Their unflappable commitment to mastery is demonstrated through a culture of revision and redemption where students have multiple opportunities to demonstrate their knowledge. In these schools teachers are supported with time for collaboration to improve their instruction and catch struggling students, opportunities for self-reflection to improve their instructional practice, as well as leadership opportunities to be decision-makers within their schools. More detailed descriptions of all of these practices and strategies can be found in the individual case studies of each school, published separately.[18] It is important to keep in mind that although we have isolated specific practices for the sake of organizing our discussion, these practices are synergistic and they work in concert to help support student achievement.

[18] Case studies can be found at https://edpolicy.stanford.edu/publications/pubs/1175

How Are Schools Fostering Persistence and Resilience?

For many students in the case study schools, a major obstacle to their success is not academic but mental. In many instances, students face the daily injustices of poverty and racism and come to high school inadequately prepared. By the time they are 14, according to Preston Thomas, principal of Life Academy, students are dealing a cumulative effect and "see barriers in why they can't, why they don't belong, why it's not their right to succeed at things."

The schools in this study recognize the importance of support and social-emotional skill development to help the students transform their mindset and persist through obstacles. The schools, to varying degrees, make this skill development and the development of strong adult-student relationships a key component of their school design. This focus is called personalization.

> "Teachers have really good relationships with students and know them well . . . relationships with students are like our cultural capital, our professional capital as teachers."
>
> *—City Arts and Tech Teacher*

> "I really like that it's smaller and the ability of teachers and staff to reach through the privacy and confidentiality and get real personal with our kids."
>
> *—Impact Academy Parent*

> "Teachers here see students as the whole student and not just a student in their classroom."
>
> *—Life Academy Student*

> "There's something about the teachers, there's this essence about them that they care. They're not the teachers that come to get paid or to say, 'I'm the teacher.' They're the teachers that come to make a difference in a student's life."
>
> *—Dozier-Libbey Medical High School Student*

Personalization is a set of practices that enables adults to know students well and tailor their interactions to meet individual students' needs. Personalization is made up of discrete practices as well as cultural norms. The schools in this study embody both. Personalization is particularly beneficial to low-income students of color, as they often face tremendous out-of-school obstacles to academic success. For many students, even making it to school in the face of limited access to transportation, violent neighborhoods, a lack of quality physical and mental health care, and inadequate housing and food is a major undertaking. Many students are in survival mode and rely on the support of the adults in school to encourage them to take academic risks and dare to envision a brighter future. The deep relationships formed between teachers and students in these schools give many students the courage, support, and skills to persist through challenges and disappointments.

The common personalization practices in the schools in this study include advisory pro-

grams, rituals and a culture of celebration, student voice and leadership opportunities, and connections to parents and community. Undergirding each of these practices are the explicit expectations that a core component of teachers' jobs is to build relationships with their students. It is the relationships that serve as the greatest support to students. As mentioned previously, of all of students' experiences, surveyed graduates cite the relationships with teachers and advisors as one of the most helpful in preparing them for college-level work.

Relationship building through Advisory

> Advisory for me . . . is a place where you reflect on your social character. It's partly academic, but it's more about yourself as a social person and what ways do you impact or in what ways do you interact with the world? Your life is not going to be all about academics all the time. You're going to need some real-life skills to live. You're going to have to know when to make the right decision and when it's okay to goof off. . . . You're developing social skills that you're going to use in real life and that you're going to need to get a job, and you're going to need to interact with people at a job. It's pretty much preparing you for real life.
>
> *—10th-grade male student, Impact Academy*

This Impact student sums up the components of advisory well. All four schools implemented advisory programs, in which teachers take responsibility for a small group of students, serve as the students' advocate and their coach, as well as a point of contact for the parents. Advisory provides a structure to facilitate deep and lasting relationships between teachers and students and has the power to become the touchstone for the school day and a central component of students' high school trajectory.

Across the four schools the advisory varies. It meets from two to four days a week, from 20 to 65 minutes a day. In some schools students have a different advisory teacher each year, in others the students stay together with their teacher for two or more years: At Life Academy the students stay with their teachers for four years. Advisory classes are typically slightly smaller than the average class size, ranging from 18-27 students. Not surprisingly, we found that students in schools that emphasized relationship building and continuous relationships with students over several years found advisory more beneficial and felt more supported by their teachers.

Within advisory, teachers focus much of their attention on building a safe and caring community. An Impact student describes advisory as an "in-school family"—a place where together they support one another through the stresses of high school. The advisor becomes like a school parent while the other students in the class are like siblings.

Advisory programs across the four schools have developmental curricula that evolve as students progress through the grade levels. For example, a focus on the transition to high school in ninth grade, transitions to career exploration, problem solving and organiza-

tional strategies in 10th, college preparation in 11th, and college applications and senior exhibitions in 12th grade.

The backbone of this curricular development is providing students with the guidance and support they need to graduate from high school and enroll in college. Toward this end, a major component of advisory is to help students set and meet short- and long-term goals. Advisors use strategies such as frequent monitoring of students' completion of school work and grades across their courses, transcript review to ensure that students are meeting the a-g college admissions requirements, frequent communication with parents—including student-led conferences, goal setting activities with students, mandatory office hours with teachers for students struggling academically, and collaborating with the students' other teachers and support staff to provide students with the academic and social-emotional support they need to meet their goals.

Advisory ensures that students do not slip through the cracks because advisors function as designated advocates for their students. Being familiar with advisees' lives and observing how they develop and grow over multiple years, the advisor is positioned to be the primary advocate, resource, and support for the advisees. Knowing the students in so many ways and over multiple years, the advisor is most aware of the student's potential and the hurdles (in-school and out-of-school) that student must overcome. Advisors are charged with making sure students are succeeding academically and, if not, advisors work with school colleagues and the student to develop strategies to reach the student's potential. It is not unusual for a teacher to look to a student's advisor as expert and partner when a problem arises in class. When needed the advisor is the one to contact parents to check in or to schedule a formal conference or meeting. In this sense, the advisor advocacy functions as a bridge between student, school, and home so that students are provided with the support they need to navigate the intricacies of high school in a productive and positive manner.

Celebrating successes helps students persist

For students who have experienced failure and a lack of opportunity and whose daily lives can be challenging, celebrating success can provide them with the fuel to persist. The case study schools vary in their approaches to celebration, which range from infusing celebration into the weekly schedule through community meetings to milestone activities, such as special trips or events that serve as a reward for students' hard work and development.

Community meetings at Impact Academy, for instance, take place weekly for an hour during the school day and are separated into the lower division (ninth- and 10th-graders) and the upper division (11th- and 12th-graders). These meetings are a place for the school community to bond. One of the administrators explains that community meetings are a time for "teachers and students to sit back a little bit and laugh, play, learn about a new topic that's relevant for the month or the time of year." The weekly meetings are co-planned by the vice principal and Associated Student Body (ASB), and students often take on the role of the emcee, helping to facilitate, giving out awards for school spirit or for

exemplary exhibitions or recognition for "small things" like turning in work on time or to celebrate students who have a big jump in SAT scores. Often the agenda for the meetings will include student presentations about something they deem important for the school community to know about, or guest speakers will visit to talk about a pertinent topic or share their experiences in college or the workplace. The meetings also include the announcement of the Spartan of the Week, a student carefully selected by teachers not only for exemplifying the Impact culture but also for demonstrating growth. The student's advisor invites the Spartan of the Week on stage to loud cheers from her peers. Her advisor hugs her and says:

> Here are some things that her teachers say about her: She is mature beyond her years, thoughtful, deep critical thinker, takes responsibility for her work, lends a hand to her peers, not only pushes herself but also her classmates. She is going to excel in college. She is a very valued member of our community.

Three students in the audience raise their hands to add praise for the student, such as, "She is a support system for me and for others." Overall the atmosphere is celebratory and relaxed, and having fun together is valued and important.

Life Academy builds its culture of care, trust, and confidence by creating school community rituals and rites of passage that push students out of their comfort zone, to be honest about their victories and struggles, and to give them an anchoring memory of their potential for success. For instance, toward the end of their 10th-grade year, students at Life Academy take a class trip to Yosemite. For most students, camping itself is an unfamiliar experience, but it is also the farthest away they have been from home, and for many of them, the first time they have been outside Oakland. Similar to the approach of Outward Bound and other wilderness programs, on this trip, students must push themselves and depend on each other to complete unique challenges in unfamiliar surroundings; this experience gives them a new perspective of themselves and their peers. For example, students are asked to complete "a 9- or 10-mile hike and up two waterfalls, which is pretty ridiculous" in the words of one student. In one of the rituals of that trip, students are asked to write on paper their "rocks, the burdens they carry with them," and crumple each of the sheets into the physical shape of a rock. All rocks are placed in a row, and students stand on one side. The accompanying teacher asks them to step over the rocks if they feel like they can move on to the 11th grade despite those burdens. A teacher describes the emotionally powerful reaction:

> There were a number of students in response to all those questions who didn't feel they could step over them, that stayed. And so we asked their classmates to help pull them over the row of rocks, to explain how they were going to help them graduate. It was really emotional. It took a long time, because there were a lot of kids that were on the side of "I don't think I can graduate," but there were also a tremendous number of kids

> who said, "Yes you can." Even kids who don't talk during the day, they said, "I know we're not super close friends but I've seen you do this specific thing in math class or I've seen you do this," and so they pulled them over. In the past we've had teachers advocate for kids. This year we just facilitated, and the kids did everything: "No, you're coming with me; I will pull you across the line to graduation," and that was really beautiful.

This emotional event focuses entirely on the students' beliefs about themselves and each other. It not only builds a stronger sense of mutual support and community but also serves as a reference point back at school: when a student struggles, the recollection, with reminders from teachers and peers, builds the student's confidence in himself and feeling that others are supporting him.

Supporting student voice and leadership

Supporting student voice and leadership in their school ensures that students are invested and feel a sense of belonging and responsibility for their school. This investment is built through relationships and translates into student investment in their own learning. It also has broader implications for their sense of efficacy in effecting change in their larger community because they experience making change in their school community.

Across the four case study schools, students are invited to play leadership roles in a variety of ways, from starting clubs to shaping school policies or sharing their experiences with school staff. In addition, within the classroom, students are given choice in project content, internships and work-based learning opportunities, in how they can demonstrate their learning as well as their selection of inter-session courses of interest.

There are particularly powerful examples of student voice at Impact Academy and Dozier-Libbey. At Impact Academy students can write a petition for any school-related issue. The petition must include an argument for how the change helps the school and must have the support of a teacher or staff member. The petitioners discuss their petition with an administrator and then bring it to the Associated Student Body (ASB) for a vote. One student describes it as "like getting a bill passed."

At Dozier-Libbey, students provide feedback that helps to shift practices for the coming year. In preparation for its Western Association of Schools and Colleges (WASC) accreditation during the 2011-2012 school year, Dozier-Libbey brought a focus group of students to the professional development session. Using a fishbowl format, teachers listened to students' suggestions on areas for school improvement. From the conversation they learned that the school needed to address problems with its advisory program, how it supported incoming ninth graders and communication among grade-level teachers. What is remarkable about this event is not that the staff listened to students but they made these areas their focal points of their work for the following year. The staff divided themselves into three committees to address the concerns.

In another instance at Dozier-Libbey the members of the first graduating class of seniors told their teachers that there were things they wished they had known in their first three years at Dozier-Libbey. The staff responded by inviting the entire senior class to speak on panels to their peers during career awareness day. Every student in the school had an opportunity to engage in a conversation with a panel of seniors. The panels were not handpicked to include only the most articulate or the high achieving students; all voices were valued. While the principal could have responded to the graduating seniors comments by having teachers present the information the seniors wished they had received, she chose to let the students themselves collectively address this gap so it remained student to student. This is a truly student-centered approach.

Making school a family affair

In large part through advisory, but also through other activities like family conferences, exhibitions of student learning, and portfolio defenses, the case study schools make overt efforts to connect to students' families. Across the four schools, parents are viewed as partners in supporting student learning. Beyond the formalized opportunities for parent engagement, parents perceive the schools as welcoming them through an open-door policy. An Impact parent relates, "I just like that I can show up at any time . . . whereas at other schools it was like 'make an appointment.'"

Within the context of advisory, advisors must partner with the student's family—not only to build trust and relationships, but also to be the school's liaison and primary contact. To parents and guardians, particularly those who did not have positive experiences when they were high school students, having a friendly contact in the school who knows them and their child allows them to engage more authentically in their child's high school education. In some of the schools, advisors conduct home visits to each advisee to build that relationship and to be familiar with more of each student's unique context. The advisor is also responsible for communicating success stories and teachers' concerns to the parents, as well as sharing the parents' concerns and questions with their advisees' teachers.

Parents have an opportunity to engage with their children's learning process by participating in students' exhibitions of learning and portfolio defenses, as described in the upcoming assessment section of this report. Three of the schools hold lengthy (30-60 minute) student-led family conferences twice a year with the student's advisor to discuss the student's academic progress, set goals, and coordinate additional supports and interventions as necessary. Because conferences are a valued part of the culture, parent participation is high: As evidenced in Table 13 on page 37, nearly three quarters of teachers at case study schools report that more than half of their students' parents attend scheduled conference, compared to less than a fifth of teachers at comparison schools. One CAT teacher explained: "[At conferences] we talk about the holistic experience of the kid and how we can enhance that if we need to." In addition, to these conferences the teachers interact with parents on an ongoing basis via online portals, emails, phone calls, and text messages.

Table 13: Teachers Report a High Level of Engagement from Parents

Teachers state . . .	Case study teachers (N=79)	Comparison school teachers (N=356)
More than half of their students' parents attend scheduled parent-teacher conferences	73%**	18%

Source: Teacher Survey[19]
*** p < .01 using Pearson's chi-squared test of independence.*

Several of the schools also provide monthly or bimonthly parent meetings and parent workshops on topics of the parents' choosing to support parents' own development. The schools also all provide parents opportunities to participate on school leadership committees.

Implications for schools

Both the specific practices of personalization as well as the cultural norms of relationship-building and treating students and families in a holistic manner require vastly expanded roles for administrators and teachers as well as structural supports. Administrators and teachers need to view their role as caring for the whole child, not just attending to academic achievement. They are tasked with the awesome job of preparing children to live in the world successfully. This expanded role means that teachers need the training to build trusting and personal relationships with students and their families and to serve in the role of advisor. Teachers become facilitators of learning rather than only content specialists. Within this context hiring criteria become particularly important. One Life Academy teacher explains, "We hire teachers who have an orientation of caring about more than just subject matter but serving students and the population." The challenge of this orientation is that when teachers make a greater commitment to their students' lives, they can get overwhelmed by the challenges in their students' lives and need support themselves.

Smaller schools can also facilitate the implementation of personalization structures such as advisory, rituals and celebrations, and student and parent leadership. To instill a culture of personalization and caring, schools need to view the allocation of time in their schedules for advisory and rituals and celebrations as not taking away from instructional time but maximizing it. The teacher survey data shows that this investment in student–teacher relationships results in a greater sense of teacher efficacy to support students. In these types of schools teachers feel empowered to help students overcome challenges by creating environments conducive to student learning and persistence, as demonstrated in Table 14 on page 38.

[19] Teacher survey is of 79 teachers (95% response rate). Comparison data is taken from The Study of Deeper Learning Opportunities and Outcomes funded by the William and Flora Hewlett Foundation and conducted by the American Institutes for Research that included several of the schools in this study. The teacher comparison sample with a total of 356 teachers includes results from 12 schools across the country within the same districts as the treatment schools. Each survey item is calculated for the actual number of responses to that item and varies from question to question.

Table 14: Teachers Feel Empowered to Help Students Overcome Challenges

Teachers feel they can do a fair amount to a great deal to . . .	Case study teachers (N=79)	Comparison school teachers (N=356)
Get students to work together	91%*	81%
Control disruptive behavior in the classroom	90%*	79%
Keep students on task on difficult assignments	90%*	80%
Promote learning when there is a lack of support from the home	83%**	64%
Get students to do their homework	62%*	49%
Overcome the influence of adverse community conditions on students' learning	58%*	44%

Data Source: Teacher Survey
** p < .05 using Pearson's chi-squared test of independence.*
*** p < .01 using Pearson's chi-squared test of independence.*

Table 15: Students Receive Individualized, Personalized Attention and Support

The following is true for students in at least three of their four core academic classes . . .	Case study students (N=569)	Comparison school students (N=1392)
My teacher believes I can do well in school	76%**	60%
My teacher pays attention to all students, not just the top students	65%**	48%
My teacher really listens to what I have to say	57%**	48%
My teacher gives me specific suggestions about how I can improve my work	49%**	36%

Data source: Student Survey[20]
*** p < .01*

The teacher's sense of efficacy in meeting students' needs rubs off on students as well. Student survey data indicate the extent to which students feel bolstered by their teachers' belief in and commitment to support them in being successful. For example, nearly three quarters of students surveyed reported that in at least three of their four academic core subjects (English, math, social studies, and science) their teachers believe they can do well (76%). Table 15 indicates how surveyed students from case study schools experience individualized and personalized attention compared to students in the comparison sample.

[20] Student survey is of 678 students (37% response rate). Comparison data is taken from The Study of Deeper Learning Opportunities and Outcomes funded by the William and Flora Hewlett Foundation and conducted by the American Institutes for Research that included several of the schools in this study. The teacher comparison sample with a total of 1392 students includes results from 10 schools across the country. Each survey item is calculated for the actual number of responses to that item and varies from question to question.

How Are Schools Preparing Students for College and Career?

As we continue into the 21st century, preparing students for college and careers requires an increasing focus on the development of the analytical and communication skills needed to navigate and excel in a dynamic, information-rich environment. Given changes in the job market, students also need the skills to collaborate with others on complex and multi-task projects and to be adaptable, so that they will be able to apply their skills to jobs and fields of study that do not yet exist. To build these skills, each of the four schools places a central focus on supporting students' leadership capacities and autonomy within the classroom, emphasizing the importance of students connecting with and applying what they are learning. These sets of skills defined by each of the schools correspond closely to the kinds of 21st century skills and knowledge identified as essential for success in college and career (Conley, 2005). These skills and knowledge become the drivers for shaping culminating performance-based assessments that students are required to complete to graduate at three of the four schools. The educators align their curricula and pedagogy to prepare students for these major demonstrations of their learning. In particular, the schools draw on relevant curricula, inquiry-based and collaborative learning, a focus on mastery, and flexible uses of time. As will be discussed further in subsequent sections, the implementation of these strategies requires that schools provide substantial amounts of academic supports for students who need it, as well as ongoing teacher professional development and collaboration.

Holding high academic expectations for all students

As discussed previously, all four of the study schools are supporting higher academic achievement for African American and Latino students, English learners, and those who live in poverty than are other schools in their districts or in the state. A core contributor to this success is the high expectations that the schools have for students from the onset, particularly their commitment to a curriculum and a course schedule that provides all students with the skills they need to get into and succeed in college. All of the schools provide a core curriculum that is aligned to the a-g requirements, the set of courses required to get into the University of California and state college system. At Dozier-Libbey, the curriculum exceeds the a-g requirements by including more advanced math and two additional years of science.

Beyond setting up a course sequence that will prepare students for college, the schools work hard to create a college-going culture and to set the expectation that all students will go to college. Schools help build students' understanding of the college application, testing, and financial aid process, providing additional supports and holding parent education meetings on these topics. Further, the schools have posters and other materials on their walls highlighting college attendance. At Impact Academy, for instance, the hallways are lined with 8x10 color photos of recent graduates and current seniors with a list of colleges they have applied to, been accepted to, and will attend the following fall semester. The display celebrates students' achievements and is a tangible reminder that the primary goal of the school is to get students into college.

"They see potential in you and let you know that by standing up for you and supporting you."

—Life Academy Student

"From the first day of freshman year the message has been 'you're going to college.' They put that in your brain."

—Impact parent

The schools also seek to address students' doubt in their own abilities and to help build the discipline they need to keep trying even when the academic content is challenging. At Dozier-Libbey, for instance, the principal said, "I think so many kids don't realize that they could go to college when they come in as freshmen. . . . Those are the ones that you really want to get. Those are the ones contributing to the achievement gap." Similarly, Life Academy places a very high value on helping students build self-confidence, providing multiple experiences for students that illustrate and model perseverance. As discussed in the section on personalization, they take 10th-grade students on a trip to Yosemite, where students tackle a long, difficult hike to the top of Yosemite Falls. The principal at Life Academy explained that most of the challenges that students face are "mental," and that experiences like the Yosemite hike serve as a metaphor for how they can tackle other seemingly insurmountable obstacles in their lives, such as passing their algebra class or the CAHSEE. The principal said, "Taking them in the outdoors and putting them in situations where they're not comfortable gives them some context." School staff can refer back to that experience, asking students, "'You remember when you were halfway up,

Students at Life Academy

your legs were burning, you were wet, cold and miserable . . . but you still made it to the top, right? This is no different, it's just a math problem sitting on a paper.' The metaphor plays out well in a lot of areas of a student's life."

At a foundational level, high expectations are driven by teachers' unshakable belief in every student's potential to be successful. As evidenced in Table 16, over 95% of teachers at the case study schools believe that their fellow teachers are committed to helping every student learn and making progress even with unmotivated students.

One 11th-grade Life Academy student explains:

> They want us to go above and beyond what we think we can do. They do push us to [even if] we don't think we'll go that far. Sometimes you feel irritated because you think that they're telling you what to do, but it's just to help you and make you do your best.

Teachers balance high expectations for their students with a sensitivity to their real-life challenges, a sensitivity that doesn't compromise high standards but instead is based on their relationships and knowledge of each student, supported by the school's personalization structures. Another student at Life Academy explains:

> The teachers don't just tell you to do your homework and then just leave it at that. If you don't have the time to actually do it because you have family issues at home, the teachers might give you an extra day.

Finally, high expectations are supported by school-wide practices that provide extra help to students who need it and that empower teachers and students to do their best. The study schools are striving to create and improve such practices, which include organizing and arranging classrooms in a way that encourages productivity, using classroom time wisely, actively engaging students in instructional tasks, keeping students engaged with tasks that are of high interest, providing timely and specific feedback, and having proactive and clear policies to encourage positive engagement.

Table 16: Teachers Provide Essential Support to Students

Teachers agree that other teachers in their school . . .	Case study teachers (N=79)	Comparison school teachers (N=356)
Provide extra assistance to any student who needs it	99%**	89%
Feel responsible that all students learn	96%**	82%
Try to make progress with even the most difficult and unmotivated students	95%**	76%
Identify challenging yet achievable goals for each student	84%**	64%
Pay attention to what motivates each student	84%**	61%

Source: Teacher Survey

*** p < .01*

Using inquiry-based instruction to actively engage youth

Inquiry-based pedagogy and group learning prepare students for college, career, and life by promoting transferable skills such as critical thinking, problem-solving, collaboration, and communication. They prioritize the analytical and interpersonal skills that students need to adapt and excel in a rapidly changing environment. Each of the schools had a formal approach to integrating this focus into the curriculum and pedagogy of the school. In Envision Education schools, for instance, students are required to demonstrate mastery in their graduation portfolios of four leadership skills, including (1) thinking critically, (2) completing projects effectively, (3) collaborating productively, and (4) communicating powerfully. Dozier-Libbey has a similar set of core attributes that graduates need to demonstrate for graduation, called "Vitals" including a requirement that students show that they are technologically competent. Finally, Life Academy requires seniors to demonstrate "habits of mind," which include dimensions such as professionalism and the ability to use evidence to support an argument or inform an analysis.

In order to help students to develop these skills, teachers need to engage students differently, creating opportunities for students to actively engage with course content, grapple with real world problems, and communicate to audiences beyond the classroom. Students explore core questions, develop theories, and make generalizations. It is also important to note that in order for inquiry-based instruction to succeed, students need to have a base level of motivation, background knowledge, understanding of the process of inquiry, and the ability to manage and see through with a complex set of activities.[21] For this reason, inquiry-based activities with the schools often occurred after the instructor has introduced core content, and with substantial scaffolding.

Inquiry-based instruction is student-centered in that it requires a deeper level of engagement with content. One student at Impact Academy pointed out, "They give us all these opportunities to actually prove that we learned something like debates and Socratic seminars and exhibitions and graduate portfolio . . . rather than just trying to teach us something and giving us a test to make sure we get it. They actually make the students prove that we actually get what they're teaching us." The driving force behind this approach is to develop students' ability to think critically, rather than to make memorization of content the central focus.

Schools use different strategies to structure their inquiry-based learning. The Envision model requires that all class activities give students the opportunity to build knowledge, apply their knowledge, and reflect on what they have learned and how they can improve. This framework is tied to the core competencies that students are supposed to be learning, which include inquiry, analysis, research, and creative expression. Similarly, at several schools including Life Academy, teachers frame the curriculum within "essential questions," such as "How do people survive the horrors of war?" and "Was capitalism or

[21] Edelson, D., Gordin, D., & Pea, R. (1999). Addressing the Challenges of Inquiry-Based Learning through Technology and Curriculum Design. The Journal of the Learning Sciences, 8(3&4), 391450. http://halshs.archives-ouvertes.fr/docs/00/19/06/09/PDF/A101_Edelson_etal_99.pdf

socialism better for American in the 20th century?"

As illustrated in Table 17, student survey results from across the schools indicate that students are benefiting from this type of instruction. When compared to students at comparison schools, students report that they are being led toward higher-order thinking skills by learning to deconstruct knowledge and reconstruct it to create new meaning. For example, 58% of student respondents report, "I use what I've learned to solve new and different problems" in three or more subjects compared to 45% in comparison schools. It should be noted that these questions set a high bar for higher-order thinking skills across content areas, as students must have these experiences in at least three of their four core classes (English, social studies, math, and science). The survey data also indicate that with just over one third of students being asked to "combine many ideas and pieces of information into something new and more complex" or "analyze an idea, experience, theory, or story by examining its various parts," across subjects, there is plenty of room for growth. This type of instruction across the disciplines is extremely challenging.

Table 17: Higher Order Thinking Skills via Knowledge Deconstruction and Reconstruction

Of my four core academic classes (English, social studies, math, and science), in at least three of them . . .	Case study students (N=678)	Comparison school students (N=1392)
My teacher makes us try to find the answers on our own before he or she answers our questions	68%**	56%
My teacher pushes me to become a better thinker	68%**	50%
I use what I've learned to solve new and different problems	58%**	45%
I combine many ideas and pieces of information into something new and more complex	37%**	28%
I analyze an idea, experience, theory, or story by examining its various parts	37%**	25%

Source: Student Survey
*** p < .01*

This type of instruction encourages higher-order thinking, and often requires more complex project-based and collaborative activities within the classroom, including interactive class projects, role playing, mock trials, art projects, presentations, and so on. This type of work can be student-led, both individually and in groups. At Impact Academy, for instance, students in government class set up a mock Congress where each student represents a state; they propose bills on the senate floor, and revise laws collaboratively. A student explained how this activity gave the class an "example of what Congress actually does instead of just reading in the textbook."

In keeping with this finding, and as evidenced in Table 18, students from the student-cen-

tered schools were two to three times more likely than students at comparison schools to indicate that they give presentations or work with other students on projects during class.

For example, at Dozier-Libbey, in a project in an economics class where students were studying the impact of the global economic crisis on their community, they had to share their learning with an oral presentation or video using economic terms. For this project students interviewed community members and took photo documentation of the economic impact on housing and access to health care.

Table 18: Student-Directed Presentations and Group Work

Of my four core academic classes (English, social studies, math, and science), in at least three of them . . .	Case study students (N=678)	Comparison school students (N=1392)
I give presentations for different purposes	60%**	29%
I work with other students on projects during class	73% **	47%
My teacher asks us to put together a portfolio of many different examples of our school work	47%**†	19%

Source: Student Survey

*** p < .01*

† Indicates sample size of N=569

Engaging students through a relevant curriculum

In order to build the skills required for college and careers, students need to be exposed to instructional content and materials that are relevant to who students are and who they want to be. That is, instructional content needs to make linkages to what students already know, while at the same time introducing information and skills that they will need in order to achieve their future aspirations. Like adults, students thrive in environments where the work that they do has intrinsic value and meaning, and even more so that it has applicability beyond the classroom. A curriculum that is intellectually challenging and connected to real-world issues supports more in-depth reflection and engagement, while also providing better support for postsecondary education and the world of work.

In career-focused Dozier-Libbey and Life Academy, relevance is created through interdisciplinary coursework, collaborative projects, and internships in the health or life sciences. The signature distinction of their curriculum, for instance, is its comprehensive integration of a health careers focus throughout students' coursework. For instance, at Life, 10th-grade students engage in an interdisciplinary project where they investigate issues of mental health in humanities and biology. In the humanities class, students read *Slaughterhouse Five*. They analyze the literary conventions of the novel, where the main character experiences flashbacks and delusions in a dream-like narrative, while also studying four mental health illnesses through a biological lens (bipolar, major depressive disorder, PTSD, schizophrenia). The project concludes

with a written assessment, where students take the role of a psychiatrist who uses textural evidence from the book to diagnose the main character of *Slaughterhouse Five*. This type of interdisciplinary work incorporates a health care focus, bringing relevance to the curriculum and illustrating how English, social studies, or science play out in the real world.

> "Students have to care about the topics they're learning about, so whether that's identifying with the curriculum from a racial aspect, from a gender aspect, from a class aspect, or from just what they're interested in today. . . . They're most engaged when you're talking about things that relate to their lives, so keeping students at the center when you're devising and coming up with the curriculum is important."
>
> *—Impact Teacher*

Relevance at the Envision schools is created through a focus on art and technology, which encourages students to think critically about themselves and their environment. At CAT, the walls of the art classes, the hallways of the school, and student exhibitions include provocative art, which speaks both to personal issues of identity and to social issues. Social justice themes are incorporated at the discretion of the teachers, who use it as a strategy to empower youth and encourage them to think critically. For instance, while exploring key events in world history, students discuss overarching themes and questions related to culture and subjectivity, the power of perspective, and resistance and complicity. Students explore issues of complicity and resistance by looking at the role of Nazi propaganda and resistance pamphlets within Germany during WWII, exploring the issue of targets and target audiences and how this information was perceived from different perspectives. As part of this unit, students watch and critique the Nazi propaganda film "Triumph of the Will," examine lyrics of The Clash song "Spanish Bombs," read survivor stories and "White Rose: The Story of Resistance," role-play various perspectives, and write a research paper.

Art at City Arts and Technology High School

Similarly, ninth graders at Impact work through a unit on identity that spans the digital arts and English classes. The project culminates in a final exhibition entitled, "Identity: A Symbolic Exploration of Self," where students present art projects and English essays that they've been working on as part of a unit on dis-

covering their own strengths, weaknesses, and life goals. When speaking to introduce the exhibition, the principal said, "We believe that students . . . are the most engaged when they are doing. Over the course of the evening you will see exhibitions around a series of personal topics. . . . Through these projects students were able to examine their own role as capable and emerging adults."

Creating time in the school schedule for deep collaborative work

It is difficult to support project-based, collaborative learning and internship work opportunities for students when using a traditional secondary school schedule, where most classes last for less than 50 minutes. Time, in and of itself, becomes a limiting factor to what kinds of learning opportunities are available to students. To address that limitation, many schools are structuring time differently, including block scheduling, work-learning days, and post-sessions dedicated to project-based activities. By creating more "space" in the schedule, schools are able to support a deeper level of student-inquiry and expose students to experiences that they would not get in a traditional school environment. Schools varied in how they allocated time, with different levels of emphasis on block scheduling, time for work-based learning, and variations in schedules from day to day.

Block scheduling is a primary strategy that schools use to create bigger blocks of learning time. The most common forms of block schedule are the A/B schedule where students and teachers meet for longer periods every other day. Dozier-Libbey, Impact Academy, and Life Academy used some type of block scheduling. Although scheduling at each school is unique, students have longer blocks of instruction (70, 90, or 105 minutes) 2 to 4 days out of the week. These longer blocks of time facilitate more group work and in-depth investigation. It is particularly useful, as well, in the lab science classes. At Impact, the classes are held at different times each day, so that first period will be first thing in the morning on Monday but the last period of the day on Tuesday; this allows students to be engaged in each class at a time when they are most alert at least once a week.

Schools also shifted their schedules to accommodate career exploration and Work-Based Learning (WBL) experiences for 11th- and 12th-grade students. An Envision-wide program called Workplace Learning Experience (WLE) requires junior and senior students to take on internships in fields that they are interested in exploring as a career. In the second semester of junior and senior years, students spend 11 or 12 weeks, up to 80 hours, at their respective internships every Wednesday. At Life Academy, junior and senior students participate in a health-related internship two afternoons a week. Finally, at Dozier-Libbey, juniors and seniors have the option of participating in a half-day job shadow or 8-week internship at a local hospital, though the school is only able to find internship opportunities for about 10% of their students.

Post-session or inter-session blocks of time enable these small schools to meet all students' course requirements. For example, Life Academy conducts a post-session

Students at Dozier-Libbey

during the final weeks of the school year. Teachers design full-day intensive courses that draw from local resources, and students select their post-session course based on interest. The post-session courses enable students to fulfill college requirements for elective classes. This design capitalizes on end-of-year energies of students while also building academic skills through students' interests and community resources, people, and history. For example, in Girls Got Game class, the students focus on and critique cultural norms of beauty in middle-class white culture compared to Latino culture while learning about nutrition, going on urban hikes, completing a cross-country run, and doing strength training.

Finally, schools deviated from their schedules for special events. For instance, at Dozier-Libbey the school offers a C3 day, which stands for career, college, and community, where students track key components of different careers as they listen to presentations from a range of about 100 presenters that include current college students, college representatives, doctors and nurses, radiologists, EMTs, medical records processors, chiropractors, and social workers, among others. This day functions to tie together students' in-school exhibitions and cross-curricular projects and connect them to college and career in a way that makes the intangible tangible.

Using assessments to support learning and mastery

One of the most distinguishing factors about a student-centered educational approach is a seismic shift in the purpose of assessments: away from a focus on accountability measures designed to separate students from one another and toward a focus on

promoting learning and mastery for all students. Student-centered schools use assessments to provide vital feedback to both students and teachers that enhance the learning process so that students can gauge their progress, providing information that helps to orient teachers and the student.

A focus on mastery is integral to the work of each of the study schools. For instance, at Dozier-Libbey, staff members are committed to ensuring that students deeply understand what they are learning, rather than focusing on grades or marching through the curriculum. Teachers use assessments to gauge students' progress toward meeting the academic standards. A school staff member explains:

> We look for opportunities for students to relearn and redo. Are the students learning and mastering the concepts that we want them to? If not, how can we give them the opportunities to learn? It is about meeting the standards or trying again. Not everyone learns at the same pace.

Student-Centered Assessment Strategies

PORTFOLIOS are collections of students' work that demonstrate their mastery of core concepts. Often students need to do a portfolio defense in front of a panel of teachers and/or community members.

EXHIBITIONS are public demonstrations of interdisciplinary student work, which require students to draw on multiple sources of evidence.

SOCRATIC DIALOGUES are facilitated conversations on an issue or topic that allow students to explore and defend their ideas.

This perspective is diametrically opposed to that of many schools in which the teachers have to march through a pacing guide or feel: "I taught the curriculum; if the students didn't learn it, that is not my problem." A focus on mastery is fundamentally student-centered in that it keeps student learning at the center rather than being directed by teacher actions.

All of the schools assess for mastery, by using assessments that reflect the kinds of literacy, mathematics, and analytical tasks that occur in the work world or in higher education. Assessments such as portfolios, Socratic seminars, exhibitions, and projects that result in tangible products encourage learners to draw on multiple kinds of knowledge in order to demonstrate higher-order and integrated learning. These types of assessments are described in the sidebar. Students and graduates of these schools consistently say that authentic assessments helped to build their confidence, leadership, communication skills, and the ability to cite evidence to support ideas. They also helped students to develop a deeper sense of investment and pride in their work. For instance, a student at Impact Academy said these types of assessments make "you feel like there's a purpose to your work instead of just putting it all in a notebook and then throwing it away at the end of the year."

All four schools use exhibitions as a way for students to demonstrate their learning, often across disciplines, and practice their communication skills. For example, at CAT, students do at least one exhibition a year. In 10th grade, students do an exhibition on *Animal Farm*, in which they do a literary analysis in English class, study the Russian Revolution in their history class, and prepare a poster of some of the symbols of the novel in their art class. For the actual presentation, they present which Russian Revolution figures are in *Animal Farm* and share their art pieces. The parents vote on who they think the best citizen and the best leader for *Animal Farm* is. Exhibitions enable students to see the interconnection between their courses as well as engage their parents in their learning.

High-stakes culminating performance-based assessments are being incubated at Dozier-Libbey and are a signature component of the other study schools. At CAT, Impact, and Life Academy their centrality to the learning process has made them a driver of instruction. At the Envision schools, 10th-grade students present a benchmark portfolio to advance to the 11th grade, and 12th-grade students must successfully defend a College Success Portfolio to graduate.

Through the creation of the portfolios and their defenses students have to demonstrate proficiency in the Envision schools' leadership skills and core competencies described in the sidebar. Because these assessments are high stakes, teachers need to be sure that the assignments or projects that students are completing in their classes embody the core competencies and leadership skills so they can be included in students' portfolios, and thus these academic skills become the drivers of instruction. Teachers are expected to structure their instruction so students have at least two portfolio-worthy projects a year.

The portfolio process itself has multiple components. Students must compile five certified artifacts (student work) that embody all the core competencies and leadership skills. Each core competency is aligned to a subject matter. So students need to include artifacts that include a research paper (science/history), literary analysis (English), inquiry (science/history), and creative expression (art). Each artifact is accompanied with a reflection that demonstrates how students demonstrated leadership skills in the completion of their artifacts. For the graduate portfolio, students must also include a detailed description and defense of their workplace learning experience. Once the portfolio's pieces are certified and posted online, portfolio students must defend their work, dissertation-style, in front of a panel of teachers, as well as in front of their peers and family members.

Envision Education: Core Competencies and Leadership Skills

CORE COMPETENCIES
- Inquiry
- Analysis
- Research
- Creative expression

LEADERSHIP SKILLS
- Communicate powerfully
- Think critically
- Collaborate with others
- Complete projects effectively

Impact Academy

The portfolio defense process serves as a rite of passage and is very moving for both students and family members. A grandmother attending a defense at CAT spoke to the panel, saying, "I feel differently about CAT now that I see how you've helped my granddaughter grow. I know she's been working really hard, but you never know until you see it and I'm so proud of how she was able to get up there and talk in front of all these people."

Reflection is a fundamental part of the assessment process at any level and ranges from daily reflections that students report on their "exit slips" for leaving their classes to more in-depth reflections that occur during portfolio defenses or exhibitions. At Impact Academy, for instance, students reflect on their academic progress during family conferences that occur twice per year; during these conferences the students, their advisors, and parents reflect on the students' academic and behavioral accomplishments and set goals for improvement. A teacher explained that "seeing the students lead those conversations and reflect on where they're at, and celebrate, and also set goals, and be pushed by families was a really unique part of the school." In the portfolio defense process, students are asked to reflect on what they learned, how they learned, and what they learned about themselves as it relates to each component of their portfolio. As one CAT senior described,

> I think that college success portfolio is really like the ultimate self-reflection, like where was I at point A and where am I now at point B and why am I now ready to go off and be a successful person? . . . You're spending four years of your life constantly reflecting and thinking about how you can make yourself better. And I think they're trying to get us into the habit of that so then when we go to college we'll already be thinking like, "Okay this is good but for my next paper how can I make this better? Oh this was great but for my next class, this discussion, this presentation, how can I make it better?"

Student survey responses provide more evidence of the value that self-reflection has for student engagement and learning. Students at study schools were considerably more likely than those at the comparison schools to report having to explain their thinking and assess their own work as shown in Table 19 below.

Table 19: Students Are Encouraged to Engage in Reflective Thinking

Of my four core academic classes (English, social studies, math, and science) in at least three of them . . .	Case study students (N=569)	Comparison school students (N=1392)
My teacher asks us to explain our thinking	59%**	36%
My teacher asks us to evaluate ourselves on our classwork	34%**	23%

Source: Student Survey
*** p < .01*

Another core quality of assessments focused on mastery is the ability for students to revise so that they can enhance the caliber of their work and produce something that demonstrates deep learning. Across all four schools students are given multiple chances to revise their work to demonstrate learning. At Dozier-Libbey, for some assignments, essays in particular, if students do not have a basic level of proficiency, they are graded DNMSDO (Does Not Meet Standard, Do Over). The students must rewrite their essays or demonstrate their knowledge in another way. Students are also encouraged to get feedback from their peers and to be open to recommendations for how they can improve. A CAT student said, "All criticism is good criticism. . . . you can always learn from some mistakes." Survey data indicate that a focus on revision cuts across core academic subjects. Table 20 on page 52 indicates that significantly more students in case study schools are asked to revise their work as compared to students in comparison schools.

Revision is a crucial piece of the portfolio defense process as well. At the Envision schools, each artifact must be high-quality, or "certified," based on criteria determined by reaching the proficient standard in the schools' College Success rubrics for each core competency. Students have multiple opportunities to revise their work until it is certified. Similar standards are held for students' defenses where students may be asked to represent several times until their work is deemed high quality. The senior defense

Table 20: Students Are Encouraged to Engage in Iterative Improvement of Their Work

Survey questions	Case study students (N=678)	Comparison school students (N=1392)
Of my four core academic classes (English, social studies, math, and science) in at least three of them my teacher often asks me to revise my work after I get feedback from teachers or other students	54%**†	26%
In my English class I improve a piece of writing as a class or with partners	66%**	50%

Source: Student Survey
*** p < .01*
† Indicates sample size of N=569

process is begun early enough in the year and with sufficient attention and support, so that even if students must revise their work for certification and represent they can complete the work in time to graduate. This insistence on quality becomes the line that teachers and administrators must hold. If the expectations are lowered, the learning process itself becomes compromised. One Impact teacher spoke about the cyclic nature of artifact certification, saying that the process itself ensures that they "do not let a kid go under the bar any longer."

The importance and centrality of authentic assessments and assessments focused on mastery cannot be overstated. Surveys and interviews of graduates identify these experiences as among the most influential on their ability to succeed in college.

Implications for schools

As evidenced throughout this section, the kind of learning that is supported in the classrooms of the case-study schools is preparing students for jobs that do not yet exist in a world we cannot imagine. This requires educators to think beyond conveying disciplinary knowledge to the facilitation of essential skills, such as working in groups, managing large quantities of information from multiple sources, problem solving, and communicating persuasively, among others. Classrooms and schools need to be organized differently to achieve these goals, including allowing students to be actively engaged in the learning process; work with others to solve relevant problems connected to their lives and world; and be supported in demonstrating, defending, and reflecting on their learning. Educators in the study schools all engage in substantive discussions about how best to balance students' need for content knowledge with 21st century skills. There is an ongoing challenge to best meet students' needs.

This kind of learning environment requires a dramatic shift in teaching for most teachers. Teachers need models, support, and time to transform their teaching. In the study schools, teachers often struggled to consistently meet the vision of learning that their schools set forth. Transforming math instruction in particular was an area of challenge for many schools. New teachers also reported that the low skill level of

many students and classroom management issues made the instructional strategies difficult for them to implement.

At the school level, transforming instruction requires the articulation of coherent shared vision of the skills and knowledge students need and the steadfast support of teachers to achieve that vision in their daily instruction. It also requires flexibility, as the study schools demonstrated, in the use of time to accommodate deeper learning and work-based learning opportunities.

Though off-site opportunities like internships and work-learning experiences were universally appreciated by students, school staff reported that identifying these opportunities and monitoring students when they were off-site was very labor intensive. These types of real-world learning opportunities require that schools have industry and community connections that take a substantial amount of time to develop. These types of opportunities are very meaningful and are vital for those schools with a career focus, but schools need to have staffing and resources dedicated to creating these types of opportunities. Ideally, districts or intermediaries engaged by districts could play a role in helping schools to develop these types of opportunities. The schools also demonstrate that integration of the career themes across the curriculum was easier to implement and also had a profound impact on students.

How Are Schools Providing Support to Students Who Need It?

Student-centered practices are often reserved for students who enter high school well-prepared, self-confident, and motivated. Additional supports are necessary in order to adopt these strategies in schools serving students who lack basic skills and self-confidence and who face constant external challenges to persist in school. In order to meet the needs of students who enter with low academic skills and face educational challenges related to poverty or language fluency, the schools have adopted in-class and out-of-class strategies to support students' ongoing academic development. These strategies include the use of advisory to provide academic support, tailoring academic materials and assessments, providing support outside regular school hours, and supporting special populations of students.

Using advisory to provide academic support

The advisory system in each school is a key support for academic success. As discussed previously, one goal of advisory is for students to have an adult at school who knows them well and is there to support them. Advisory teachers become advocates for their students to ensure that no kid is going to slip between the cracks, addressing emotional issues facing students, while also keeping track of students' overall academic performance. Advisory, therefore, supported academic success primarily through the development of "soft skills," such as how to handle conflicts or where you should go if you need help.

In addition to providing a space for students to focus on the development of these types of soft skills, advisory was used to discuss goal-setting, career exploration, and to provide structured support around college selection, SAT/ACT preparation, college applications, and financial aid. At Dozier-Libbey, advisory is a time when students catch up on school work and get tutoring support. Students can stay in their advisory class, treating it like a study hall, or they can visit another teacher's class, like office hours. One teacher comments, "It's a great time for students to catch up and to get help for the next day." A 10th grader adds, "Kids can go to any subject and teacher to get help and they can collaborate with the teachers or students as well." Rather than attending advisory class, advanced students can apply to be peer coaches. These students, about 60 each year (10% of the student body), meet with a designated advisor to learn how to coach students and then are assigned to different teachers' classrooms in math, science, and English during advisory to provide peer tutoring to students.

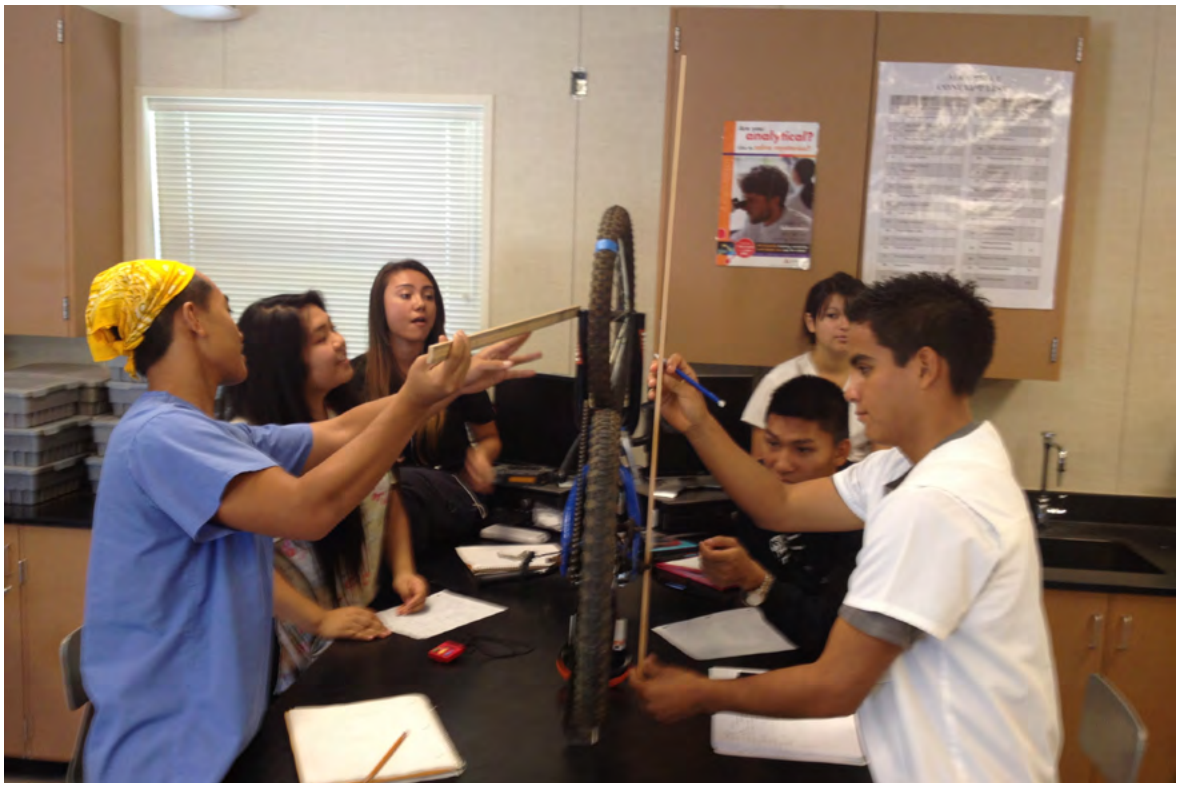
In many ways, the advisor serves as a counselor, tracking students' academic progress, whether they are on track to graduate, to complete a-g courses, to manage their portfolio and project defenses, and to complete their college applications. When students struggle, the advisor gathers input from the students' other teachers and works with them and the student to develop personalized strategies to support that students' success. In this way the teachers can have a unified approach to supporting each of their students.

Accommodating Different Skill Levels by Tailoring Instruction and Materials

Students at the study schools enter with very different academic levels. Teachers described that they often have students reading at the fourth grade level in the same classroom as students reading at a college level. This creates unique and ongoing challenges for teachers. Although a work in progress, each school has structures in place that create the space for teachers to provide additional support to those who need it.

The Envision Education schools have adopted the workshop approach of instruction, an approach that is student-centered in that it provides the space for individual work and for ongoing scaffolding of learning by teachers and proficient peers. In the workshop method, teachers engage students in a 10- to 15-minute "mini-lesson" on a core concept or demonstrate a hands-on activity. During this mini-lesson, teachers talk through their thinking process, demonstrating for the students how to approach the problem or activity. A teacher at CAT describes, "I want [students] to watch me first, and then I want [students] to try it and engage. . . . I'm like, 'Okay I'm modeling it for you. I'm showing how I do it. I want you to use this if you're confused later.'" Students are then released to work on a problem or activity on their own, in pairs, or in small groups. During this time, the teacher moves around the classroom to answer questions, check for understanding, and provide more focused support to the students who need it. In some cases, students who have a strong grasp of a concept are encouraged to help their peers.

The workshop method serves as a vehicle through which teachers can differentiate



Students at Dozier-Libbey

instruction and engage one-on-one with students, meeting them where they are rather than expecting students to be at the same level. A teacher at Impact described that this approach "works particularly well with struggling students," and the strategy is "student-centered [in that teachers are] talking more with students in the classroom and it's not as lecture-based." Teachers also use a variety of different feedback mechanisms to gauge student understanding and identify students who are struggling with particular concepts. Similarly, at Life Academy, teachers build in quick assessments of student understanding by looking at the submitted homework and listening to student responses. Then as students begin to work, the teacher can move around the classroom to provide support to individual students.

In order to provide scaffolding and differentiated work, Envision teachers rely on regular formative assessments like exit tickets and class work to determine what adjustments to their pedagogy and curriculum are needed. For students who are misunderstanding central concepts, the teacher will assign adapted work—tasks that are different in terms of difficulty or length but still require students to access the same curriculum concepts. One history teacher at Impact Academy explained that she differentiates in a variety of ways for her students based on what is challenging for them.

[For] some students it's executive functioning stuff, for others it's skill deficits, or it's reading—how much they are being asked to read, or eliminating elements of a project,

creating an alternative assignment, or doing lots of scaffolds for writing. . . . I do a lot of literacy stuff with all the students, but basically I try to figure out what is their capacity if they're working super hard and just modify and scaffold as appropriate.
Differentiation should not be mistaken for low expectations, as the schools are using differentiation as a means of scaffolding student learning to ensure that they can meet the rigorous and college-prep-level expectations.

Providing support outside of regular school hours

In order to ensure that students have the support they need to succeed, the schools offer a variety of different support structures outside the regular school hours. For instance, at Dozier-Libbey, all incoming ninth graders are invited to "boot camp," which is an extended orientation to high school. The goal, as one teacher explained, is to help students "not have the deer-in-the-headlights feeling when they come on campus. We wanted them to already have membership." The curriculum and length of the boot camp varies by year, but it generally focuses on how to use a planner, meeting teachers, and team-building activities.

At Impact Academy, teachers are required to host office hours after school to ensure that students are academically successful. Office hours are reminiscent of college office hours where professors make themselves available to students outside of class for further help, discussion, and support. The one-on-one nature of office hours allows for teachers to give students individualized attention that may not be available during class time. The other important aspect of office hours is that it requires students to advocate for their own learning, a component of the Impact model that has been highlighted as important by students, parents, and alumni of the school. Although teachers are required to have at least one hour per week of office hours, they are available much more often than the minimum of one hour. Midway through each semester struggling students can be required to attend office hours if they are not completing their work or if it is poor quality. As one Impact student explained, "You couldn't get out of [office hours] until you got your grade up. You have no choice but to pass. You kind of have to try to fail. If you fail you can [blame] yourself."

At Life Academy, several teachers are paid to stay after school to provide tutoring (which is required for students who have poor grades, and voluntary for others), and others teach credit recovery during the summer. Less formally, teachers at Life Academy choose to be available for students during lunch or before and after school to provide support. One student reflected, "If you're not getting it, the teachers will stay with you until really, really late even though they don't have to. They will stay with you and they will explain it until you get it, and even if you get frustrated they won't let you give up." Life Academy also has an on-site College Career Information Center (CCIC) staffed by University of California at Berkeley students, many of whom are bilingual and grew up in East Oakland.

Supporting special populations of students

As highlighted previously, the study schools have substantial populations of students who are English language learners (ELL) and who are classified as special education students, with Individual Educational Plans (IEP) or who have learning disabilities. For instance, at Life, 30% of students are classified as ELL. Meanwhile, the principal at CAT reported that 20% of the school's students qualify for special education services, a percentage that is almost twice that of their district average 11%.[22] However, while these schools have a high percentage of students who need additional support, the schools do not have a lot of additional resources to support them. For the most part, because special populations are mainstreamed into courses, the schools try to serve these students by using the same differentiation strategies that they use for all students. They also rely on teacher collaboration, something that will be discussed further in the next section. Several of the schools have special education teachers and aides who push into the classroom to support students' learning needs within the context of their courses. Special education teachers also meet regularly with grade-level teams to ensure that students' IEPs are met and also help teachers plan their instruction in a way that will meet all students' needs.

In addition to relying on classroom teachers to provide support to special populations, the Envision Education schools have a learning center for special education students and other students who need additional support. Impact Academy has two learning specialists, while CAT has three. The learning specialists are special education teachers, who work with general education teachers to make modifications and provide accommodations for students with learning disabilities. On some occasions, learning specialists provide push-in services where they co-teach with general education teachers while at other times they pull students out and provide small group or one-on-one instruction as needed or as dictated by their IEPs.

Life Academy and Dozier-Libbey offer specialized services for ELL students. For English learners in early stages of language acquisition, Life Academy has a separate reading intervention class that uses Read 180, and teachers are trained in English language development strategies that they integrate into their instruction to support English learners. Two resource teachers work in both pull-out and push-in formats to provide assistance and monitoring for students with special needs. Dozier-Libbey offers a similar language support class to its lowest level English learners but lacks additional staff to support the ELL students. CAT and Impact do not have dedicated staff to support ELL students but rather rely on their differentiation strategies as well as an emphasis on academic vocabulary across the curriculum to support these students.

Implications for schools

High expectations and standards in the absence of academic supports lead to student failure because students cannot span the gap between their level of preparation and the expectations. Academic supports without high expectations also lead to failure as

[22] Audit of Programs and Services for Students with Disabilities San Francisco Unified School District. September 2010. Urban Special Education Leadership Collaborative (the Collaborative).

students do not have the skills or knowledge for college and career success. Supporting high academic achievement for *all* students begins with a shared belief among all school stakeholders, including students, parents, teachers, and administrators, that all students can make it to college. Although low aspirations and expectations may be the biggest hurdle to promoting high levels of success for all students, students also often enter these schools underprepared for a college curriculum and lacking confidence in their own abilities. In short, the numerous academic and personal challenges that students face provide multiple points for potential failure. To overcome these barriers, schools need to clearly communicate their support for every student, use multiple strategies to provide additional support for students, provide teachers with strategies to differentiate instruction and assessment in the classroom, and provide external supports to address the needs of special populations.

These supports require tireless efforts among school staff, most of whom put in long days, including weekends. It often means that teachers make themselves available to students and parents around the clock. As a result, teacher burnout is a real challenge in these schools as all the school staff give so much of themselves to support their students' success. Furthermore, a lack of sufficient resources for student support, particularly for ELL students, places an additional burden on the classroom teacher.

How Can Schools Support Student-Centered Practices?

Creating and sustaining schools committed to the kinds of student-centered personalization and instructional practices described in this report require substantial investment in building and supporting staff capacity. This capacity-building has multiple components, including an investment in creating a shared school-wide vision; supporting grade-level teacher collaboration; building teacher expertise in pedagogy, curriculum, assessment, and academic support; providing opportunities for staff to reflect on their practice; supporting a model of distributed leadership that includes teachers; and benefiting from external support of the district, charter management organization, or community partners.

Building a shared vision of the school's mission

At all four case study schools, the staff, students, and parents can easily articulate what their school is about. This is a result of an investment in the visioning process that engages teachers, parents, and community members. In these schools the vision serves not merely as a mission statement that hangs on the wall but as the basis for all decisions. For example, Dozier-Libbey benefited from a two-year investment into the creation of the school prior to its opening, in which the principal was hired and had the opportunity to visit other schools, study research on small schools, and have the support of an advisory committee. She was able to hire her staff one year prior to opening. The founding teachers hashed through the difficult work of clarifying their vision and determining how it translated into policies and practices. The principal focused early on relationship-building among the staff, engaging in a consensus model of decision-making

Student learning and opportunity at the center of the schools' visions

"Every student valued, every student challenged, every student prepared to succeed in a changing world."

—Dozier-Libbey Medical High School

"To dramatically interrupt patterns of injustice and inequity for underserved communities in Oakland through transformative learning experiences focused on health, medicine, and bioscience, students are engaged in learning and inspired to acquire the skills, knowledge, and habits necessary to succeed in college and careers in the medical field."

—Life Academy

and providing ample training opportunities for her staff to develop competency in their instructional model.

All the schools invest continually in building a commitment to a shared vision through inquiry and shared and distributed leadership for developing school policies. For example, during his first year at CAT, Principal Daniel Allen hosted a series of professional development sessions with administrators and teachers to collaboratively define what effective CAT-style teaching looks like. At these sessions, administrators and teachers shared and debated all aspects of what Principal Allen calls "the architecture of a results-oriented classroom." Through these sessions, CAT staff defined and put into action an understanding that while teachers should be empowered to innovate, they should also be held to clear and shared expectations of what it means to be an effective teacher at CAT in service of their mission to "transform students' lives by preparing them for success in college and in life." These conversations led to the school-wide adoption of six common instructional practices, known internally as the "CAT Classics." While teachers still utilize a wide range of instructional strategies in the classroom, teachers know they will be supported in learning and using the CAT Classics.

Prioritizing time for teacher collaboration

Across all four schools a priority is placed on time for collaboration, particularly grade-level collaboration. In most of the schools these grade-level teams have time allocated for collaboration weekly, although many teams also meet informally by having lunch together or gathering after school or on the weekends. The teams typically consist of teachers in each of the core academic subjects as well as teachers that provide support for students with Individual Education Plans (IEPs), English language learning needs, or other special needs.

This collaboration serves as the driver of cross-curricular projects and assignments and managing performance-based assessments. These meetings also enable teachers to support their students, particularly those who are struggling, in a collaborative way. For example, teachers within a grade-level team may discuss their concerns about a student's academic progress, share strategies and challenges, and then create a group action plan to engage that particular student. A CAT administrator explained:

> [Family meetings are] a really good way for teachers to communicate about kids; that's how the entire team can be informed on a student that's struggling. And it helps to break some of the isolation that a teacher might feel if they think they're the only ones who are really struggling with a student.

Beyond attending to the needs of their students, the grade-level team serves as a space for teachers to learn from each other and improve their practice. Many teams set learning and practice goals for themselves and work throughout the year to monitor and address those goals. For example, at Impact Academy, one of the grade-level teams was working to develop year-end goals for what they wanted their students to know and be able to do in reading and writing. Teachers also benefited from understanding what one another was teaching so they could connect their instruction, balance student workloads on major assignments, and reinforce others' practices in their own classrooms. For example, at Dozier-Libbey the health teacher explained:

> I can do things in class that help the [students] with their physiology or English. If they're doing a big assignment, I can try to do something that supports what they're doing. I feel like that helps a lot with the student experience. They know that we're communicating with each other. I think that just makes them feel better about what they're doing.

In all schools, these grade-level teams have a lead teacher who develops the agenda for the meetings, and who represents their grade-level team to the administration on school-level leadership teams.

The schools also make time for other types of collaboration, although not as frequently, including content area collaboration to articulate what students should know and be able to do at each grade level. They also meet in cross-grade-level collaboration. For example, Impact teachers often meet in lower-division (ninth and 10th grade) and upper-division (11th and 12th grade) groups.

Supporting teacher leadership

All four schools have implemented a system of distributed leadership, both out of necessity to realize their goals for students as well as out of belief that the school will function best by keeping the decision making power closest to the classroom. Teachers are most knowledgeable of which practices and policies will best benefit their students. Distributed leadership requires the principal role to change as well, as they let go of some decision-making power, while providing teachers ample time and support to make decisions in the best interests of students.

All four schools have a core leadership team that consists of a grade-level representative and administrators. These groups are charged with making strategic and big picture decisions for the school, identifying ways to support staff, and framing the yearlong

professional development arc. At Life Academy, the question during the 2013-14 school year was, "How are we as teachers interrupting patterns of injustice?"

The leadership team model for decision-making is crucial to building a coherent instructional vision that is shared by staff and reinforced through policy decisions. An Impact teacher described the process in the following way, "Decisions go through the lead teachers or the lead staff and then it gets to the teachers during a professional development day and then we either pass it or not and every single person votes." Using collective intelligence in this way makes for a more synergistic and cohesive team of educators working toward a common goal.

Beyond the leadership team, teachers participate in content specific teams to address the school's academic goals and priorities. Across the schools, these teams have managed performance-based assessments, led efforts to improve student literacy, examined student data, revised advisory programs, created a system of support for incoming ninth graders, and worked to enhance communication across grade-level teachers. Some of these groups are permanent and others serve in a more ad hoc capacity, but all empower teachers to engage in meeting the needs of all the students in the school through the school's visions for student success. This creates a vastly different culture than in the traditional U.S. high school where teachers work in isolation in their own classrooms, and control and concern are bound by their classroom walls.

The school-wide commitment to a shared vision enacted through distributive leadership is reflected in how the teachers describe how school is organized to enhance student learning. Table 21 illustrates how the distributive leadership model ensures that teachers feel that decisions focus on what's best for student learning, that learning expectations are well defined, that there is consistency in the instructional approach, and that programs have sufficient follow-through to ensure that they are working.

Table 21: The School Is Organized in a Way to Enhance Student Learning

Teachers agree that . . .	Case study teachers (N=79)	Comparison school teachers (N=356)
The school day is organized to maximize instructional time	96%**	79%
The school has well-defined learning expectations for all students	89%**	73%
There is consistency in curriculum, instruction, and learning materials among teachers in the same grade level at this school	83%**	58%
When making important decisions, the school always focuses on what's best for student learning	92%**	62%
Once we start a new program, we follow up to make sure it's working	87%**	48%

Source: Teacher Survey
*** p < .01*

Promoting a culture of reflection

A culture of reflection permeates all four case study schools: This introspection is built into professional development foci, the principals' approaches to leading through questioning, the focus on personalizing instructional support for teachers, and through the creation of a culture where teachers are encouraged and provided with the time to observe each other's classrooms and identify areas of growth.

For example, at Impact Academy, professional development is built around a school-wide gap or common growth area collectively determined by the staff. At CAT, the principal believes that by encouraging teachers to share their work, teachers are able to expand their "repertoire of instructional strategies" by drawing upon each other's expertise, identifying promising practices, and working together to address shared challenges in the classroom. Many teachers share this sentiment and feel that transparency helps them to better understand and support their peers. The following quotes capture the school's philosophy toward transparency.

> [We want to be] giving teachers the tools—and in the case of teachers who already have those tools, the opportunity to share those tools and be leaders—of what powerful instruction looks like on a daily basis. . . . [We want] each member of the team to have an idea of what this teacher is trying to do, and what this teacher perceives as his/her own classroom.
>
> —*CAT Principal*

> I think the more public our teaching is, the more people understand and can see where our mindsets are and where we're coming from when we talk about our curriculum or share our thoughts and whatnot. We're all different, but we all have to teach to the same kids.
>
> —*Teacher*

Across departments, CAT teachers are filming their peers as they teach and sharing lesson plans via web-based platforms. The teachers are also sharing demonstration lessons during professional development sessions so that, according to the principal, they can "isolate the elements of architecture that they employ in their classrooms for one another." By continuing to invest in practices that support teachers to both share and document their work, the principal and other administrators hope to build a school-wide culture that is not only receptive to continuous learning but also views improvement as an ongoing priority.

Evidence of the hard work of reflecting on and improving practice is illustrated through the teacher survey data in Table 22 on page 63. A high percentage of teachers report that other teachers in their school have made changes to best meet the needs of the school's diverse student body and engaged in the systematic analysis of their own teaching practice.

Table 22: Teachers Continually Improve Their Practice to Lift Achievement for Each Student

Teachers agree that other teachers in their school . . .	Case study teachers (N=77)	Comparison school teachers (N=356)
Have made changes to best meet the needs of the school's diverse student body	94%**	75%
Are engaged in systematic analysis of teaching practice	84%**	62%

Source: Teacher Survey
*** p < .01*

Across all the schools, principal leadership is key to supporting a safe space for self-reflection, providing teachers with authentic leadership opportunities and decision-making power, as well as being unwavering in their commitment to the school vision, which also results in extremely positive teacher perceptions of their administrators, as evidenced in Table 23.

Table 23: School Leadership is Connected to Teacher Development and Student Learning

Teachers agree that their principal . . .	Case study teachers (N=77)	Comparison school teachers (N=356)
Communicates a clear vision for our school	95%*	85%
Understands how children learn	96%**	85%
Makes clear to his or her staff expectations for meeting instructional goals	91%*	80%
Presses teachers to implement what they have learned in professional development	86%*	75%

Source: Teacher Survey
** p < .05*
*** p < .01*

Just as in the classroom teachers conceive of their role more broadly to facilitate and support student learning, so must principals conceive of their role as modeling, facilitating, and supporting inquiry, self-reflection, and risk taking among their staff. The principals across all four schools strive to build a cohesive and positive staff climate, through a gentle leadership approach, being responsive to staff morale, supporting collaboration, sharing decision-making, and holding time for team-building and celebration among the staff.

Enhancing adult learning through a network of support

Although all of the schools provide quality professional development, Envision Education, as a network of schools, has a particularly strong model for supporting its teachers, because its approach reflects a deep understanding of the school community, while

prioritizing peer observation, mentoring, and genuine exchanges between school leaders and teachers that support reflection and lead to enhanced practice.

The Envision Education Support Office functions as a resource to its school administrators in ensuring that their leadership facilitates research-based, highly effective, and student-centered practices aimed at garnering strong student achievement results. One such way to foster innovative and reflective practices is through the use of a practice called "instructional rounds," devised so that each school in the network can get valuable feedback from other educators within the Envision network. This process of continual observation, feedback, action plan development, and more observation leads to a culture that values reflection and action. The instructional rounds also function to provide key support and feedback to the principal who must juggle the challenges of providing staff with enough support in their already demanding jobs, while focusing his feedback to teachers on specific, school-wide strategies to ramp up the effectiveness of instruction.

Another way that this reflective practice is promoted system-wide in Envision schools is through the annual leadership huddle where, in June, each lead team from each school gets together to reflect and plan. For the huddle the lead team plans out the school's goals for the next school year and devises a plan on how to introduce the goals to the staff in such a way that the staff can be accountable for follow-through throughout the year. The foci for the year, which in 2012 at Impact Academy was literacy and the workshop model of instruction, are then incorporated into the professional development meetings, and teachers work together to build on what this means at their school with regular discussions and analysis of videotaped teaching and student work samples.

Implications for schools

In order to empower educators to prioritize relationships and transform instruction, schools must create the time and the space for teachers to collaborate on multiple levels and give them a key role in deciding which types of professional development will lead to meaningful changes in practice. While allocating substantial time for teacher collaboration may seem to take away from instruction time, it maximizes the quality. From collaboration, teachers know their students better; can create common expectations, practices, and assessments; and develop interdisciplinary instruction. Furthermore, teaching can be tremendously isolating, but through collaboration, professional learning opportunities, and shared decision-making, it can feel like a team effort toward a common goal.

However, even with time allocated for collaboration, sharing of practice, learning together, and reflection, the challenges of transforming students' lives take their toll on teachers. This is particularly true in schools such as those in the study that serve students who face many obstacles daily. The flip side of deep relationships with students is that teachers feel every lost student acutely. To ameliorate the exhaustion, heartbreak, and relentless nature of the job, school leaders need to monitor the morale of their staff

closely, celebrate the staff frequently, and provide opportunities for relationship building among the staff. For example, Life Academy staff take an overnight retreat twice a year as a major strategy to build adult morale and relationships and reflect on their work.

The kind of coherent and student-centered instructional vision, focus on relationship-building and shared decision-making exemplified in the study schools requires a different kind of school leader as well. Just as the teachers in these schools function as facilitators of student learning, school leaders need to lead as facilitators of teacher learning and leadership. They need to create a safe space for teachers to take risks, feel comfortable with peer observations, and openly share challenges and strategies that are successful in their classroom. School leaders need to be comfortable sharing the decision-making process as well, so that teachers, students, and parents share in the ownership of the school.

Supports That Enable Student-Centered Schools

This report documents the key practices and outcomes of four schools that are using a student-centered approach to open the doors of opportunity to low-income students of color. The exemplary work of these schools is supported by strong leadership, visionary thinking, and committed teachers. Creating high schools that are designed around student, rather than adult, needs requires more than a mind shift and hard work; it requires the conditions to enable that shift in beliefs to be translated into action. The schools in this study benefit from supportive conditions and would be able to push their practice to be even more student-centered with increased supports.

All schools that are serious about closing the opportunity gap need support at multiple levels including internal school-level supports for teachers, from the district or charter management organization level and up to the state and federal level. In this research we identified three areas of support that substantially influence the ability of high schools to engage in student-centered practices:

1. **Funding policies** that shape what resources are available and how they are used;
2. **Human capital policies** that influence teachers' and school leaders' capacity to implement student-centered practices;
3. **Instruction and assessment policies** that impact what is taught and how student learning is measured.

Funding Student-Centered Schools

Inadequate funding hampers the study schools from fully realizing their goals for creating student-centered schools. Insufficient funds impact the study schools' ability to hire and retain quality teachers and to provide enough services to meet the needs of their students. The schools also lack adequate funding to meet the needs of particular populations of students, especially English language learners. Because there are not adequate staff to serve these students, the study schools rely on classroom teachers to make up for their absence, who do not always have the necessary expertise to make up for this gap.

Until 2013, California schools faced year after year of budget cuts and a complicated funding system in which schools had little autonomy over how to spend their scant resources. As was detailed in the previous section, threefold differences exist between districts in how they are funded. In 2013, California implemented the Local Control Funding Formula, a weighted student formula that enables schools serving high-need populations to receive additional funding. This funding formula, one of the most progressive in the country, has the potential to dramatically change the quality of resources

available to schools with high percentages of low-income students, English language learners, and foster children. The funding will increase gradually over eight years. While this is a substantial improvement over the previous state funding system, it remains to be seen whether the increased funding will be sufficient, as California still lags behind other states in per pupil funding. But as a model, it holds tremendous promise and should be held up for other states to consider.

Human Capital Policies That Support Student-Centered Teachers and Leaders in Urban Schools

Addressing human capital needs is the heart of transforming schools. Teachers need to enter the profession well prepared to address students' academic as well as social emotional needs. Initial preparation and induction are not enough, however. In order to succeed, teachers and administrators, individually and collectively, need ongoing support to assess, reflect, and revise their approach in a continuous cycle of inquiry.

Both a strength and a challenge for the schools in the study is their access to teachers and administrators who understand, believe in, and can implement student-centered practices. Envision Education has a well-developed hiring procedure that includes a group interview process in which teacher candidates, in addition to the traditional interview, observe instruction and provide a written reflection on their observation, conduct their own demonstration lesson, and work with a small group of candidates to design a project-based learning unit. In this way, Envision Education seeks to assess candidates holistically to determine how well they will be able to support its model.

Preparing educators for student-centered schools

Study school principals report that in addition to careful screening processes they have found that teachers trained by a handful of high-quality pre-service teacher education programs in the Bay Area are better prepared to address students' social, emotional, and academic needs through interactive, relevant, and authentic instruction. However, the schools often do not have access to such teachers, as the high-quality teacher preparation programs have relatively small cohorts, and competition to hire these teachers is fierce.

States can improve schools' access to educators—including teachers, administrators, counselors, and others—who are prepared to offer high-quality, student-centered instruction by:

- Setting standards that include expectations for learning these practices;
- Effectively enforcing these standards through accreditation and licensing processes that look carefully at whether candidates have the opportunity to learn these skills and can demonstrate them in practice;

- Investing in the development and expansion of such high-quality programs for urban and poor rural schools;
- Investing in service scholarships for a diverse pool of talented recruits that support them in completing high-quality programs and reward them with forgiveness of their debt for teaching in high-need schools for a period of 4 or 5 years. (For a more in-depth discussion, see Darling-Hammond & Sykes, 2003.)

Equalizing salaries and working conditions

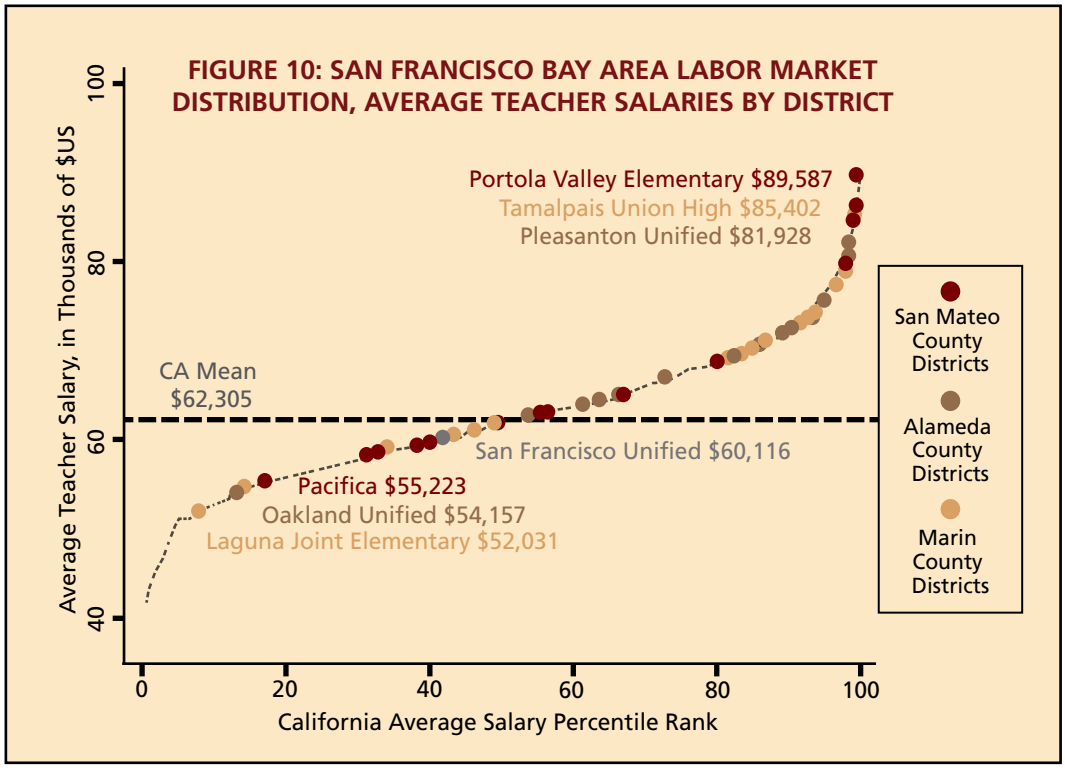
One of the greatest obstacles to the study schools, and schools in general that serve concentrations of students of color and students in poverty, is an inability to offer competitive salaries and working conditions. This has been a particular challenge for Life Academy in Oakland, and for the schools in the Envision Education Network. As a result, while the study schools are sometimes able to attract high quality, idealistic, and committed teachers early in their career, they struggle to retain them as young teachers start families and can no longer afford the low salary.

In California, like many other states, gross funding inequities exist between districts. These inequities result in vastly different teacher salaries from one district to another (Adamson & Darling-Hammond, 2011). In 2008, the average teacher salary in California was $62,305; in the Bay Area it was upward of $70,000. However, in San Francisco, where CAT is located, and in Oakland, where Life Academy is located, average salaries were well below the state average: $60,116 and $54,157, respectively. These salaries compare to a high of $89,587 in nearby Portola Valley, where many venture capitalists send their children to school. Furthermore, these low salary schools typically have larger class sizes and less plentiful materials, supplies, computers, and other instructional tools.

Figure 10 on page 69, which shows the gross inequities in teacher salaries in the San Francisco Bay Area, illustrates why it is difficult for schools in high-need urban districts to compete in the labor market for well-qualified educators. As a result of these inequities, the low salary districts are less able to recruit and keep highly qualified candidates, especially those who have more education and experience.

Adamson and Darling-Hammond (2011) recommend several policies at the state and federal levels to address these inequities.

- The first recommendation, a weighted student formula that provides per-pupil funding based on the needs of actually educating students who live in poverty, are new English learners, or encounter other risk factors, was just implemented in California through the Local Control Funding Formula and will be discussed in more depth later in this section.



Source: Adamson and Darling-Hammond (2011)

- A second recommendation is that, once funding provides a level playing field, states should create incentives for districts to equalize salaries and hire more qualified staff. In addition to defining standards for teacher quality and taking a proactive role in supporting teacher education and development programs, states can support such local action by reporting state and district data about the distribution of teacher qualifications and/or by expecting districts to justify their expenditures in terms of their outcomes, as the new Local Control Accountability Program will do in California.
- At the federal level, Adamson and Darling-Hammond (2011) recommend that the government require states to include evidence of progress toward equitable funding and equitable distribution of qualified teachers alongside their reports of academic progress.

Supporting new and veteran teachers' learning and reflection

Once teachers are hired, the schools in our study are conscious of the need to provide them with adequate support. The small size of the schools and strong grade-level teams are key supports to inculcating new teachers to the school culture and expectations. However, new teachers often come to the schools with low levels of exposure on how to teach in a nontraditional setting, and this, coupled with the challenges associated with classroom management that many new teachers face, leads to some painful transitions

for some teachers (and their students). In many cases, teachers are expected to create their own student-centered curriculum from day one. Many of the schools in the study are relatively new; as they mature, they can begin to codify their practice so new teachers are not left starting from scratch to develop all their curricula.

Formal structures to mentor new teachers can also be tremendously beneficial to support newer teachers. California was one of the first states to create and fund a formal induction program (the Beginning Teacher Support and Assessment Program, or BTSA); however, recent funding cuts and changes to eliminate categorical designations for funds have caused the mentoring once offered by many local programs to shrink or even disappear. Several states, including New Mexico, Ohio, and Oregon, recognize the importance of supporting early-career teachers and have developed multiyear induction programs to support teachers as they develop their practice (National Opportunity to Learn Campaign, 2013). Teachers in the study schools all benefitted from some BTSA mentoring. In addition, more veteran teachers informally took newer teachers under their wing and helped them with curriculum planning and classroom management.

Despite the supports for new teachers, they reported feeling challenged by the demands of developing a student-centered curriculum. The induction of new teachers and clear guidance about curricula (particularly in the early phases of their tenure) are very important for instructional quality and could also help with teacher retention and morale. The principal of CAT, recognizing a lack of adequate supports for new teachers, wrote a workbook to orient and support them on the kinds of student-centered practices they are expected to implement.

Professional development time is sacred in the study schools. Time allocated for professional learning is not dominated by communication on mundane or bureaucratic matters that could be conveyed through e-mail. All the schools implemented set grade-level collaboration time in which teachers' discussed the needs of students they shared, as well as how their curriculum plans might intersect. By emphasizing grade-level collaboration over departmental collaboration, the emphasis stays squarely on student needs rather than delivery of content. This is an intentional priority. However, for the sake of a coherent instructional plan, schools need to strike a balance so teachers can articulate subject-specific learning goals for students from 9th grade through 12th grade. Finding sufficient time for both horizontal and vertical collaboration—a feature of some other successful student-centered schools (see, e.g., Darling-Hammond, Ancess, & Ort, 2002)—is a challenge for these schools, which would benefit from more built-in collaboration time if it were possible to restructure the schedule sufficiently to allow for it. Many jurisdictions—like Singapore, Australia, Canada, and Shanghai—go much further, offering several hours of collaborative planning time to all teachers each week and additional time to beginners so they can learn from their colleagues and become effective sooner, while enabling senior teachers to share and refine curricula through lesson study and other methods.

In addition to collaboration time, teachers need models of effective instructional practice. The schools in the study, to varying degrees, provide teachers release time to observe each other's instruction. In the Envision schools, a few teachers also had the opportunity to observe instruction in other Envision schools. While peer observation is helpful, if all the teachers in the school are inexperienced or are struggling with similar challenges, it can be more beneficial to travel outside of the school for models. School-to-school networks have proven successful in England, Canada, and Australia by providing all schools opportunities to learn together, as well as enabling struggling schools to secure mentorship from schools that could offer positive exemplars of practice (Darling-Hammond, 2012). Furthermore, a school-wide inquiry focus that is connected to each teacher's individual inquiry or action research focus can also assist the value of observations.

Teacher development policies should include not only school-wide professional development but also individual professional development plans, perhaps connected to teacher evaluations. All teachers, but newer teachers especially, would benefit from a development plan that includes identifying an area of growth, a set of personally relevant goals, and observations of a peer who is strong in that area as well as an opportunity to be observed by their peers and provided with feedback.

Beyond supporting individual teachers, the school as an institution needs to function as a learning organization by creating a culture where failure is part of learning and by developing a shared focus on student learning. Through weekly all-school professional development, the school leaders, administrators, and teachers model a self-reflective approach to improved practice. For example, at Impact Academy the vice principal was concerned about the sometimes punitive, ineffective, or arbitrary nature of the discipline policy. He presented an alternative model of restorative justice for reflection and discussion. It was not presented as a mandated policy, but rather as a potentially more student-centered approach worth piloting, reflecting on, and reevaluating. The entire staff was involved in this discussion, and the vice principal modeled a norm of risk-taking to get to a more effective practice.

Too often teachers experience episodic, superficial professional development disconnected from their daily work. In contrast, teachers in each of the study schools benefited from a staff-identified, focused, yearlong area of attention. This focus shapes professional development and enables the staff to dig deep into important topics, such as literacy or academic support. At Impact, teachers engage in regular discussions, analysis of videotaped teaching, and examination of student work samples as components of inquiry into their focus areas. These in-depth examinations of topics enable teachers to learn from each other and collectively define their goals and expectations.

While schools often do a decent job of supporting the staff, principals can feel isolated and unsupported. In Envision Education and Linked Learning schools, the principals benefit from being part of a larger organization or network. In the Envision schools, principals participate in instructional rounds and the leadership huddles, described in

the previous section on school practices. These network-level supports provide school administrators with the professional camaraderie and leadership support they need to guide their school's foci for the coming year. In this way, the CMO or district operates as a support rather than an accountability monitor. For the Linked Learning schools, principals have opportunities to attend semi-annual professional development sessions with leaders from other Linked Learning schools across the state where they can exchange promising practices and learn from each other.

School, district, and state policies could support professional learning needed to support student-centered practices by:

- Providing more focused and better funded supports for teacher induction in the form of trained mentors with released time to coach beginners in their early years on the job. States can help organize mentor training through universities and districts, while providing or incentivizing funding for mentors' time to work with novices.
- Supporting teacher curriculum planning and documentation through the provision of time for collaborative planning and the provision of useful templates for recording and sharing curriculum units and lessons, both within schools and across schools.
- Supporting meaningful professional development at the state and local levels through state guidelines for professional learning opportunities. Learning Forward (previously the National Staff Development Council) has developed guidelines that many states and districts use as a starting place (Jaquith, A., Mindich, D., Wei, R.C., Darling-Hammond, L. (2010). Arkansas, Connecticut, and New Hampshire, among others, have developed such legislation and guidance, which includes thoughtful strategies for professional development both connected to and separate from teacher evaluations (National Opportunity to Learn Campaign, 2013).
- Developing and explicitly supporting networks of like-minded schools that are working on similar problems or strategies, like those supported in Kentucky, New York City, and Boston, as well as Australia, Canada, the UK, and Shanghai.
- Designing teacher evaluation so that it encourages teachers to engage in goal-setting and inquiry to support their growth, supported by colleagues who offer counsel, modeling, and peer observation.
- Focusing on the examination of student-centered practices and authentic student work in teacher evaluation and professional development, and including professional collaboration as a skill to be developed, demonstrated, and "counted" as part of professional competence. (See, e.g., Darling-Hammond, 2013.)

Implementing Student-Centered Instruction and Assessments

Student-centered instruction, such as inquiry and project-based instruction, collaborative learning, relevant curricula, and performance-based assessments are all challenging to implement effectively. In addition to developing expertise in these student-centered practices, educators need to address certain tensions that arise within their classrooms and in their schools. The schools are all thoughtful about how they address the tensions as they strike a balance in the classroom between

1. Instruction that addresses gaps in basic skills and that which is student-directed,
2. Teacher autonomy and common practices,
3. Student responsibility and opportunities for revision,
4. Individual classroom-level assessments and common grade-level assessments.

The schools grapple with the challenge of enacting an idealized vision of student-centered instruction that did not always work for the students they served. When students come to school lacking basic skills and reluctant to persevere through obstacles, the teachers need to modify how they structure instruction. This modification is one that needs to be negotiated on a school-by-school and a classroom-by-classroom basis, because students vary in their skills and their willingness to take on challenging tasks. The students within the study schools often required substantial direct instruction in order to gain the skills necessary to execute complex projects. Foundational skills and work habits are often instilled in the beginning part of the year, setting the stage for more complex projects.

Key to a student-centered learning environment is instructional coherence where students do not need to adapt every class period to new classroom practices, procedures, and expectations. This is particularly true for students who are also struggling to master the academic content. Each of the schools is purposeful in the balance it strikes between teacher autonomy and common practices. At each of the schools, a strong school-wide instructional vision and strategy helps to (1) provide clear expectations for teachers as to what instruction should look like, and (2) increase coherence and continuity in student experience across classes. CAT has instituted common practices of how it begins and ends each class to create coherence while supporting teacher creativity and autonomy in the curriculum design.

Instructional coherence also comes into play in terms of teachers' differing abilities to integrate inquiry-based, project-based, and group learning experiences into their instruction. These approaches are challenging instructional strategies to execute well, particularly in subjects like math that have not traditionally been taught this way. Teachers, particularly first or second year teachers, need more materials and examples for how

they can use this strategy in their classrooms. Broad scale sharing of student-centered lesson plans and interdisciplinary projects would be very helpful for furthering the implementation of this approach.

When assessing student learning, the schools keep their eye on the goal of learning rather than strict adherence to a pacing guide or emphasizing test preparation. This assessment orientation means that students have multiple opportunities to revise their work and that if they performed poorly on an assessment they can demonstrate their learning in an alternative way. Educators have to strike a balance between (a) providing students multiple opportunities and alternative ways of demonstrating their learning and revising their work and (b) instilling in their students an ability to complete their assignments with quality in a timely manner. This mastery orientation impacts schools' grading policies and homework policies as traditional point systems for completed work may not correspond to a mastery orientation where student learning is the goal rather than mere completion of work.

Finally, the schools believe in high standards for student work that should be demonstrated in an authentic and interdisciplinary way through a culminating performance assessment. These high-stakes performance assessments require the involvement and commitment of the classroom teachers throughout the students' four years in high school to prepare them for the final assessment. Teachers have to juggle their individual classroom instructional goals with the school-wide assessment goals and actual assessment tasks so they are sure that students have completed tasks within their own classrooms that fit into larger school-wide instructional and assessment goals.

The assessment systems also benefit from the instructional coherence created by clear expectations and assessment rubrics for measuring students' development of cross-cutting skills, such as critical thinking. Each of the schools in the study has clearly articulated life or leadership skills that students need to demonstrate before graduation along with rubrics for assessing those skills. The articulation of these skills creates clarity around the importance of these skills for students, teachers, and parents but also requires teachers to be mindful of these goals in their own instruction and assessments.

For years, the kind of assessment orientation advanced by the study schools was at odds with the state of California's standardized assessment system, the California Standards Test. Current policy changes help align state assessment policy to the assessment practices of the study schools. In 2010, California adopted the Common Core State Standards (CCSS), and in 2011 they joined the Smarter Balanced Assessment Consortium (SBAC). The new SBAC assessments were piloted in the spring of 2014 and will be fully implemented in the 2014–15 school year. As the California State Superintendent's Office reported in 2013:

> At the heart of the recommendations is a clear vision and commitment to establishing a bold and innovative assessment system that includes a

> variety of assessment approaches and item types that model and promote high-quality teaching and student learning, and sets a course to ensure that all California students are well prepared to enter college and careers in today's competitive global economy (Torlakson, 2013).

The Smarter Balanced Assessment Consortium (SBAC) assessments adopted by California include some performance tasks and may be more aligned to the instructional practices in the study schools and can be helpful in providing student-centered schools with useful data on the level of rigor of their instruction. However, these assessments will not provide as deep a set of experiences and insights as the schools' existing performance assessments and portfolios do. In this climate of alternative assessment models, the state and districts should create or, at least, support performance-based assessments that are well calibrated and can be used as reliable assessments of student learning and skill development.

To support these practices, state and district policy must also find a balance between common goals and local opportunities for invention and innovation that are tailored to the needs of students and schools. Alignment and coherence are important, but they cannot be negotiated entirely at a remote level of government. Once states have adopted standards and provided curriculum resources for educators to draw upon, their role in guiding practice should be modest, while their role in supporting learning should be robust.

- States and districts should ensure that educators are prepared not with a single pedagogy but with a wide repertoire of strategies that support student-centered learning in both teacher-directed and student-directed ways. Well-educated teachers should then be free to use this range of strategies as they are appropriate for different students, curriculum goals, and learning contexts, without being asked to follow a narrow script or single approach.
- Similarly, states should limit directives to schools that would constrain practice in ways that may not be productive for all students or contexts, but instead support school-wide learning so that educators can adopt and adapt practices that are successful in their settings. States and districts can facilitate this learning by documenting and disseminating successful practices and supporting schools in learning from the research and from each other through conferences, networks, site visits, and other strategies.
- Finally, states should adopt a limited set of state-level assessments that support the kinds of deeper learning opportunities central to student-centered schools, and then encourage local use of even more robust assessments that allow students to inquire, investigate, collaborate, present, and defend their ideas, as well as to think critically

and be creative. States or districts could provide models of these kinds of assessments and encourage local development for use as part of a broader accountability system that emphasizes meaningful learning for students as a major goal.

Conclusion

As this research shows, creating student-centered learning environments is one of the most promising ways to address the opportunity gap for low-income students of color. This study increases our understanding of how to narrow that gap by illuminating the conditions necessary to transform the schools serving traditionally underserved students. However, student-centered practices represent a dramatic shift from traditional school practices of the last century. Although, some of these practices have been implemented in isolated schools, they have struggled to take hold in an educational policy environment geared toward preparing students to perform on narrowly defined high-stakes tests.

Transforming the kinds of learning spaces most needed by underserved students requires site administrators and teacher leaders who are well prepared to create authentic learning experiences for students, grounded in the students' lived experiences while addressing students' gaps in knowledge and skills. Educators need strong pre-service training as well as ongoing support to interrogate their practice to ensure that they are meeting students' needs. Transforming schools requires adequate funding to attract and retain high quality teachers. This is no small task, but the practices of the schools in this study shed some light on the types of teaching and support for teachers needed to achieve these goals.

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Appendix A:
Methodology and Data Sources

School Selection

The study schools were selected from two signature models of student-centered learning in California that can inform efforts to redesign high schools nationally. The two models are Linked Learning Pathways and Envision Education. While the two models are distinctive, they have many fundamental similarities that reflect the characteristics of student-centered learning. Both models provide learning experiences that prepare students for college and meaningful careers. Each of the models has developed authentic curricula that connect classroom learning with real-world contexts.

The Linked Learning Pathways model integrates rigorous academic instruction with a demanding technical curriculum and field-based learning—set in the context of one of California's 15 major industry sectors, such as business and finance, building and environmental design, biomedical and health sciences, engineering, information technology, manufacturing, or arts, media, and entertainment. Coursework is designed to engage students in applications of knowledge; students undertake internships and collaborative projects that conceptualize "school" and time in new ways that connect them to the community; performance-based learning is at the center of the educational experience. Either as autonomous schools or as smaller learning communities (SLC) within a large comprehensive high school, Linked Learning Pathways also emphasize collaboration among district, school, industry, civic, and other community stakeholders in support of student success.

Envision Education, grounded in the four R's of rigor, relationships, relevance, and results, also engages students in applied learning, with a focus on arts and technology as these intersect with academic content. They employ community-based internships and proficiency-based performance assessments as means to give students an active role in their own learning. Strong relationships are supported by advisory systems and new models for organizing the curriculum. Envision Education de-emphasizes standardized multiple choice tests and seat time and emphasizes student growth toward mastery of the key content and skills in each of six core disciplines. Subject-specific performance outcomes and analytic rubrics guide tasks that engage students in the real work of scientists, historians, artists, mathematicians, researchers, and analysts, as well as demonstrating proficiency in world language, oral presentation, and the use of multimedia technologies. These enable teachers to evaluate what a graduate knows so as to inform teaching practice. The performance outcomes are designed to drive the design of rigorous projects and performance assessments, lead teachers to align instruction and design scaffolding to help students achieve these valued outcomes, and provide a clear set of expectations for students' performance-based work.

While there were only three Envision Education schools to select from, there were many more Linked Learning schools. For the two Linked Learning schools, we employed a rigorous, multipronged selection process that included:

- compilation of a list of all Linked Learning schools that had completed the certification process;
- communication with staff from ConnectED and researchers at UCLA's Idea, who had conducted a previous study of Linked Learning schools, to identify schools that had both strong student-centered practices as well as strong student outcomes, including low rates of student attrition;
- screening recommended schools to ensure that their student outcome data, particularly for traditionally underserved students, exceeded state and district averages;
- careful exploration of seven possible schools' student-centered practices; and
- interviews with school leaders of four possible schools to determine their interest in study participation and the extent of student-centered practices at their school.

Study Methods

The Student-Centered Schools study was conducted from winter 2012 through spring 2014. The research employs mixed methods, with data drawn from multiple sources.

Qualitative data

Qualitative data was gathered during multiple site visits to each school between spring 2012 and fall 2013 that included interviews and observations. Interviews were conducted with school staff, parents, current students, graduates, and community members. Observations were conducted of classrooms, school activities, staff collaboration, and professional development and performance assessment activities. In selecting teachers to interview and classrooms to observe we took care to document the practices of a diverse group of educators in terms of grade level and content taught and years of experience. In total we conducted 80 interviews and focus groups and nearly 100 observations. Table 24 on page 81 details these data sources.

Surveys

Surveys were administered to teachers, students, and graduates. Teacher and student surveys were conducted in collaboration with the American Institutes of Research (AIR), which was conducting the Study of Deeper Learning Opportunities and Outcomes (funded by the William and Flora Hewlett Foundation) concurrently with the Student-Centered Schools study. Because the AIR study included two of the same

schools that we were studying and the AIR survey closely aligned with our research goals, we used their teacher and student survey data from the overlapping schools and administered the same survey to collect data from the two schools in our study that were not included in the AIR study. For the two schools not included in the AIR survey we added a few questions to the survey. Survey response rates can be found in Table 25. The AIR study included a comparison sample of schools that were selected to correspond to each treatment school in their study. The comparison schools were in the same district, demographically similar in terms of percentage of students receiving free and reduced lunch, percentage African American, percentage Latino, and percentage White students. Furthermore, unlike the treatment schools, the comparison schools had not participated in any networks or reform efforts. Complete survey results can be found in the technical report for this study, bound separately (https://edpolicy.stanford.edu/publications/pubs/1200).

Employing the AIR survey enabled us to draw on its full database for the study, which

Table 24: Data Sources

Type of data source	Who	Number
Interviews	Administrator	16
	Teacher	32
	Community member	2
	Graduates	20
Focus groups	9th and 10th graders	3
	11th and 12th graders	4
	Parents	3
Observations	Classroom and advisory	51
	School observations	11
	Professional development/collaboration time	9
	Performance assessment observations (defenses, portfolio assessments, etc.)	26

Table 25: Survey Data

Type of data source	Who	Number
Surveys	Student survey	678 surveyed Response rate 37%
	Teacher survey	79 surveyed Response rate 95%
	Graduate survey	170 surveyed Response rate 21%

included a national comparison sample of 12 additional schools. For the teacher survey data the comparison sample comes from 356 teachers from 12 schools across the country. For the student survey the comparison sample comes from 1392 students from 10 schools across the country.

We analyzed the survey data for statistical significance by comparing the combined means of valid responses of the student-centered schools with those of the comparison sample. A Pearson's ^{2} (chi-squared) test was used to determine whether there was a statistical difference between these two groups, and we reported the associated *p* values for each. A *p* value smaller than 0.05 indicates a statistically significant difference between the responses at the 95% confidence level.

Graduate surveys were administered through Survey Monkey to graduates from the classes of 2008–2011 from each of the study schools. Individual survey links were sent to graduates for whom we had e-mail addresses (obtained through their schools, teachers who knew the graduates, or through social media networks such as Facebook). A general survey link was posted to the schools' Facebook pages to solicit additional responses. After multiple attempts were made to contact graduates directly, school staff who knew the graduates personally were asked to contact them to improve the response rate. Generally speaking, the highest response rates were from students who graduated more recently. Response rates to the graduate survey were 11% (CAT), 22% (Impact), 27% (Life), and 49% (Dozier-Libbey).

Tracking college enrollment and persistence

Two sources of data were used to track college enrollment: 1) the National Student Clearinghouse (NSC) and 2) individual student follow-up. First, if schools did not already have an account with the National Student Clearinghouse, we asked them to register for an account and to request the graduate college enrollment data. In some cases, districts had already registered and requested the NSC data. Envision schools (CAT and Impact) already had the data. Dozier-Libbey Medical High School and Life Academy made the requests through their district offices. The datasets for each school provide the dates of enrollment for each graduate who ever matriculated in any registered college, and any withdrawals or transfers. Because the NSC data are incomplete (because not all colleges or training programs participate in the Clearinghouse, or because of college registrar error), we also followed up with graduates who were not on the NSC enrollment lists through email and/or school staff. We classified students enrolled in vocational training programs as well as those who enlisted in the military as being enrolled in a postsecondary training program. We supplemented the NSC datasets with additional enrollment data that we obtained through this second method. Once the datasets were as complete as possible, we calculated initial college enrollment rates for each graduating class, as well as second-year, third-year, fourth-year, and, for CAT High School, fifth-year persistence rates. We also analyzed transfer from two-year to four-year colleges and disaggregated persistence rates by type of college (two-year versus four-year colleges).

We also interviewed a small sample, 4–6 students, of graduates from each school. The students were selected to represent student populations that are underrepresented in college (first-generation college goers, economically disadvantaged students, and students of color), students enrolled in different types of colleges (two-year, four-year, and training programs), and different genders. All interviews were conducted by telephone and averaged 45 minutes in length.

Productivity analysis regression models

Productivity analysis was conducted using multiple regression models on data drawn from three school districts—Oakland, Antioch, and Hayward Unified School Districts—and from Envision Education.[23] Three regression models were used for each district: one for each of CST ELA, CAHSEE ELA, and CAHSEE mathematics scores. In each case, CST and CAHSEE scores were transformed into standard units (z-scores) to allow comparability across grades.

Each model controlled for a range of student-level variables: students' prior achievement, students' parents' level of education, student gender and ethnicity, English language learner status, eligibility for free or reduced lunch programs (Antioch and Hayward only), participation in a special education program, and whether a student repeated a grade in high school, or was chronically absent (Oakland only).[24] The CST ELA model also controlled for the level of difficulty associated with each grade level.

The available data used in the regression models differed between districts. Data from Oakland consisted of 7232 students (211 from Life Academy) from four cohorts across years 2006–2012, while data for two cohorts were available for each of Antioch (2752 students, 331 from Dozier-Libbey) and Hayward (2463 students; 151 from Impact Academy) for years 2008–2012 and 2009–2012, respectively. Data were excluded for students following a transfer between a student-centered school and another high school in the same district so that students' learning could be attributed to either, but not both, a student-centered school or other school in the same district.

The projected achievement level in each model was estimated excluding scores for student-centered schools from the regressions. This enabled us to compare actual achievement in the student-centered schools with the average projected achievement based on similar students from all other schools in each district.

CST ELA regressions

The CST model used an autoregression, a time series approach in which the projected CST ELA score in each year is estimated using the previous year's score as the measure of prior learning. Tables 26-28 on pages 84–85 show the standardized regression coef-

[23] Data were also collected from San Francisco Unified School District. However, the data set for the corresponding school—City Arts and Technology High School—was insufficiently complete to conduct the analyses.

[24] Chronically absent was defined as absent from school for more than 20 days.

ficients, standard error, t-score, and *p* values for each coefficient in each of Oakland, Antioch, and Hayward districts. A smaller *p* value indicates a higher degree of statistical confidence that the variable is a relevant predictor of student achievement in the statistical model.

The regression coefficient for prior learning represents the average difference in student achievement in z-scores associated with a one-unit difference in prior learning when holding all other variables constant. The coefficients for the other variables represent the difference in student achievement associated with that group as measured relative to a defined reference group. These reference groups were: Latino for ethnicity, high school graduates for parent education, female for gender, and Grade 9 for grade level.

CAHSEE ELA and mathematics regressions

The CAHSEE model used a multiple regression approach to estimate projected student achievement on each of CAHSEE ELA and mathematics using Grade 8 CST ELA and mathematics scores, respectively, as the measures of prior achievement. Standardized units (z-scores) were again used to allow comparison across grades and between CAHSEE and CST tests.

Table 26: Oakland CST ELA

Variable	Coefficient	Std. Error	t	P>t
Z-score ELA Prior	.7418	.0065	113.88	0.000
African American	-.1423	.0142	-10.02	0.000
Asian	.1378	.0126	10.96	0.000
White	.1941	.0253	7.67	0.000
Filipino	.0382	.0485	0.79	0.431
Pacific Islander	-.0934	.0457	-2.05	0.041
Native American	.0010	.0818	0.01	0.990
Other Ethnicity	-.0214	.0551	-0.39	0.699
Parent Grad School	.1435	.0253	5.68	0.000
Parent College Grad	.0562	.0158	3.55	0.000
Parent Some College	.0335	.0144	2.33	0.020
Parent Not HS Grad	-.0235	.0120	-1.97	0.049
Male	-.0371	.0094	-3.93	0.000
English Language Learner	-.1998	.0159	-12.56	0.000
Retained Grade	-.0209	.0346	-0.60	0.546
Absent (>20 school days)	-.0712	.0197	-3.61	0.000
Special Education Program	-.1286	.0185	-6.95	0.000
ELA Grade 10	-.1310	.0110	-11.95	0.000
ELA Grade 11	-.1446	.0116	-12.48	0.000
Constant	.0965	.0144	6.70	0.000
Adjusted-R2	.704			

Table 27: Antioch CST ELA

Variable	Coefficient	Std. Error	t	P>t
Z-score ELA Prior	.7753	.0109	71.08	0.000
African American	-.0566	.0251	-2.25	0.025
Asian	.1707	.0503	3.39	0.001
White	-.0100	.0249	-0.40	0.687
Filipino	.0647	.0381	1.70	0.090
Pacific Islander	-.0382	.0692	-0.55	0.581
Native American	-.0622	.0875	-0.71	0.477
Other Ethnicity	.0938	.0479	1.96	0.050
Parent Grad School	.1291	.0345	3.74	0.000
Parent College Grad	.1037	.0257	4.04	0.000
Parent Some College	.0525	.0233	2.25	0.025
Parent Not HS Grad	.0110	.0369	0.30	0.765
Male	-.0352	.0174	-2.02	0.044
English Language Learner	-.1378	.0352	-3.92	0.000
Free or Reduced Lunch	-.0803	.0206	-3.90	0.000
Special Education Program	-.2122	.0372	-5.71	0.000
ELA Grade 10	.0153	.0190	0.80	0.423
ELA Grade 11	-.0862	.0237	-3.64	0.000
Constant	-.0069	.0291	-0.24	0.812
Adjusted-R^2	.679			

Table 28: Hayward CST ELA

Variable	Coefficient	Std. Error	t	P>t
Z-score ELA Prior	.7497	.0116	64.46	0.000
African American	-.0707	.0320	-2.21	0.027
Asian	.1136	.0354	3.21	0.001
White	.0415	.0362	1.15	0.252
Filipino	.0865	.0368	2.35	0.019
Pacific Islander	-.0249	.0428	-0.58	0.560
Native American	-.1176	.0922	-1.28	0.202
Other Ethnicity	-.1229	.5398	-0.23	0.820
Parent Grad School	.1294	.0553	2.34	0.019
Parent College Grad	.0549	.0338	1.62	0.105
Parent Some College	-.0209	.0259	-0.81	0.420
Parent Not HS Grad	.0061	.0252	0.24	0.809
Male	-.0707	.0190	-3.71	0.000
English Language Learner (in G8)	-.2217	.0276	-8.02	0.000
Free or Reduced Lunch (in G8)	-.0299	.0232	-1.29	0.198
Special Education Program (in G8)	-.2258	.0423	-5.34	0.000
ELA Grade 10	.0150	.0187	0.80	0.424
Constant	.0688	.0315	2.18	0.029
Adjusted-R^2	.705			

The regression coefficient for prior learning thus represents the difference in projected student achievement on CAHSEE associated with a one-unit change in Grade 8 CST scores holding all other variables constant. The reference groups for categorical variables were the same as for the CST model.

The outcomes of the regression models are shown in Tables 29-31 (ELA) and Tables 32-35 (mathematics). The adjusted-R^2 values—indicating the 'goodness-of-fit' of the statistical model—were generally higher for CAHSEE ELA than for mathematics, due in part to the different subject tests taken by students in Grade 8 mathematics.

Table 29: Oakland CAHSEE ELA

Variable	Coefficient	Std. Error	t	P>t
Z-score ELA (G8)	.6955	.0113	61.60	0.000
African American	-.1843	.0255	-7.24	0.000
Asian	.1128	.0222	5.08	0.000
White	.1231	.0397	3.10	0.002
Filipino	-.0464	.0799	-0.58	0.561
Pacific Islander	-.0356	.0636	-0.56	0.576
Native American	.0247	.1521	0.16	0.871
Other Ethnicity	-.0759	.0660	-1.15	0.250
Parent Grad School	.1450	.0409	3.54	0.000
Parent College Grad	.0693	.0268	2.58	0.010
Parent Some College	.0747	.0260	2.88	0.004
Parent Not HS Grad	-.0176	.0214	-0.82	0.412
Male	-.0687	.0163	-4.21	0.000
English Language Learner	-.3420	.0295	-11.59	0.000
Retained Grade	.0020	.0822	0.02	0.980
Absent (>20 school days)	-.0999	.0352	-2.84	0.005
Special Education Program	-.2610	.0376	-6.94	0.000
Constant	.0600	.0235	2.56	0.011
Adjusted-R2	.703			

Table 30: Antioch CAHSEE ELA

Variable	Coefficient	Std. Error	t	P>t
Z-score ELA (G8)	.6853	.0168	40.90	0.000
African American	-.1743	.0397	-4.39	0.000
Asian	.1737	.0678	2.56	0.011
White	-.0546	.0386	-1.42	0.157
Filipino	-.0143	.0623	-0.23	0.819
Pacific Islander	-.2171	.1252	-1.73	0.083
Native American	-.0898	.1281	-0.70	0.483
Other Ethnicity	.0481	.0691	0.70	0.486
Parent Grad School	.1881	.0517	3.64	0.000
Parent College Grad	.1757	.0425	4.14	0.000
Parent Some College	.0849	.0377	2.25	0.024
Parent Not HS Grad	-.0445	.0534	-0.83	0.405
Male	-.0855	.0268	-3.19	0.001
English Language Learner	-.3038	.0522	-5.82	0.000
Free or Reduced Lunch	-.1215	.0310	-3.91	0.000
Special Education Program	-.3913	.0569	-6.88	0.000
Constant	.1323	.0436	3.04	0.002
Adjusted-R^2	.681			

Table 31: Hayward CAHSEE ELA

Variable	Coefficient	Std. Error	t	P>t
Z-score ELA (G8)	.6864	.0194	35.40	0.000
African American	-.0873	.0528	-1.65	0.098
Asian	.0731	.0537	1.36	0.174
White	-.0111	.0583	-0.19	0.848
Filipino	.0324	.0553	0.59	0.558
Pacific Islander	-.0601	.0632	-0.95	0.342
Native American	-.1041	.0942	-1.10	0.269
Parent Grad School	.0874	.0954	0.92	0.360
Parent College Grad	.0880	.0505	1.74	0.081
Parent Some College	.0362	.0421	0.86	0.391
Parent Not HS Grad	-.0018	.0396	-0.05	0.964
Male	-.1112	.0294	-3.79	0.000
English Language Learner (in G8)	-.2414	.0441	-5.48	0.000
Free or Reduced Lunch (in G8)	-.0748	.0355	-2.11	0.035
Special Education Program (in G8)	-.4515	.0840	-5.38	0.000
Constant	.1208	.0474	2.55	0.011
Adjusted-R^2	.660			

Table 32: Oakland CAHSEE Math

Variable	Coefficient	Std. Error	t	P>t
Z-score Math (G8)	.5687	.0110	51.51	0.000
African American	-.2801	.0272	-10.29	0.000
Asian	.3160	.0268	11.80	0.000
White	.2118	.0420	5.04	0.000
Filipino	.1281	.0944	1.36	0.175
Pacific Islander	-.0251	.0664	-0.38	0.706
Native American	.0847	.1599	0.53	0.596
Other Ethnicity	.0429	.0846	0.51	0.612
Parent Grad School	.1935	.0434	4.46	0.000
Parent College Grad	.0754	.0288	2.62	0.009
Parent Some College	.0660	.0274	2.41	0.016
Parent Not HS Grad	.0080	.0245	0.33	0.745
Male	.1089	.0182	5.99	0.000
English Language Learner	-.4157	.0306	-13.57	0.000
Retained Grade	-.0918	.0996	-0.92	0.357
Absent (>20 school days)	-.2263	.0339	-6.68	0.000
Special Education Program	-.4250	.0380	-11.19	0.000
Constant	-.0200	.0260	-0.77	0.442
Adjusted-R2	.646			

Table 33: Antioch CAHSEE Math

Variable	Coefficient	Std. Error	t	P>t
Z-score Math (G8)	.5749	.0177	32.51	0.000
African American	-.2226	.0458	-4.86	0.000
Asian	.3283	.0782	4.20	0.000
White	.0510	.0461	1.11	0.268
Filipino	.1506	.0793	1.90	0.058
Pacific Islander	.2000	.1363	1.47	0.142
Native American	-.0137	.1721	-0.08	0.937
Other Ethnicity	-.0420	.0863	-0.49	0.627
Parent Grad School	.1908	.0611	3.12	0.002
Parent College Grad	.2054	.0481	4.27	0.000
Parent Some College	.1164	.0434	2.68	0.007
Parent Not HS Grad	-.0560	.0618	-0.91	0.365
Male	.0684	.0315	2.17	0.030
English Language Learner	-.4616	.0519	-8.90	0.000
Free or Reduced Lunch	-.1181	.0373	-3.16	0.002
Special Education Program	-.5872	.0490	-11.99	0.000
Constant	.0040	.0507	0.08	0.937
Adjusted-R2	.573			

Table 34: Hayward CAHSEE Math

Variable	Coefficient	Std. Error	t	P>t
Z-score Math (G8)	.6303	.0188	33.55	0.000
African American	-.2707	.0556	-4.86	0.000
Asian	.1869	.0558	3.35	0.001
White	.1925	.0664	2.90	0.004
Filipino	-.0028	.0606	-0.05	0.963
Pacific Islander	-.0876	.0706	-1.24	0.215
Native American	.0565	.1680	0.34	0.737
Parent Grad School	.2503	.0990	2.53	0.012
Parent College Grad	.0950	.0562	1.69	0.091
Parent Some College	.0406	.0462	0.88	0.379
Parent Not HS Grad	-.0630	.0421	-1.49	0.135
Male	.2008	.0319	6.29	0.000
English Language Learner (in G8)	-.3083	.0425	-7.25	0.000
Free or Reduced Lunch (in G8)	-.0863	.0391	-2.21	0.027
Special Education Program (in G8)	-.5254	.0912	-5.76	0.000
Constant	.0094	.0501	0.19	0.852
Adjusted-R2	.605			

Assessing productivity

The regression models provided the basis for the projected achievement in each district. School productivity was assessed by comparing the mean difference between actual and projected scores for students in the student-centered schools with that corresponding to all other schools within the same district.

The productivity outcomes for each school are also measured in standard units (z-scores). A positive score represents the estimated value added to student achievement relative to other schools in the district, and after accounting for prior learning and the range of student-level characteristics in the regression models. A t-test was used to estimate whether the estimated productivity was statistically significant at the 95%, 99%, and 99.9% confidence levels (represented by one to three asterisks). The test compares the ratio of the mean productivity difference between school and district to their variability.

The results for each model are shown in Tables 35-37 on pages 90-92. The tables display the mean productivity level, and the number of valid scores and 95% confidence interval associated with each estimate.

A table of standard normal probabilities for z-scores was used to interpret the size of the results. Z-scores of magnitude 0.1 and 0.2 are associated with probabilities of 0.54 and 0.58, respectively. This is equivalent to a movement of four and eight percentage points within a distribution for a student initially located at the mean.

The proportion of students with positive productivity scores in the student-centered schools was compared to that of all other schools in the same district. A Pearson's ^{2} (chi-squared) Test of Independence was used to estimate the likelihood that the two groups are statistically independent. The *p* values from this test are shown in Tables 3-5.

Table 35: Life Academy (OUSD)

Productivity (CST ELA)		**N**	**95% C.I.**	
All	0.11***	467	0.07	0.15
Parents, no college	0.12***	397	0.07	0.16
English language learner	0.14**	148	0.07	0.21
Latino	0.11***	374	0.06	0.16
Adjusted-R2	0.704			
Productivity (CAHSEE ELA)		**N**	**95% C.I.**	
All	0.19***	160	0.11	0.26
Parents, no college	0.19***	134	0.11	0.26
English language learner	0.26***	53	0.15	0.38
Latino	0.19***	128	0.11	0.27
Adjusted-R2	0.703			
Productivity (CAHSEE Math)		**N**	**95% C.I.**	
All	0.30***	157	0.21	0.4
Parents, no college	0.34***	131	0.24	0.44
English language learner	0.31***	50	0.13	0.48
Latino	0.33***	125	0.22	0.43
Adjusted-R2	0.646			
* p<0.05, **p<0.01, ***p<0.001				

Table 36: Dozier-Libbey High (Antioch)

Productivity (CST ELA)		N	95% C.I.	
All	0.10***	681	0.06	0.14
Parents, no college	0.15**	161	0.08	0.22
Free/Reduced lunch	0.10***	381	0.05	0.15
African American	0.08	115	-0.01	0.17
Latino	0.14***	254	0.08	0.20
Adjusted-R^2	0.679			
Productivity (CAHSEE ELA)		**N**	**95% C.I.**	
All	0.08*	263	0.02	0.14
Parents, no college	0.22**	64	0.08	0.35
Free/Reduced lunch	0.11*	147	0.03	0.19
African American	0.19*	45	0.05	0.32
Latino	0.06	97	-0.04	0.16
Adjusted-R^2	0.681			
Productivity (CAHSEE Math)		**N**	**95% C.I.**	
All	0.13**	263	0.05	0.20
Parents, no college	0.27**	65	0.10	0.42
Free/Reduced lunch	0.17**	147	0.07	0.27
African American	0.17	44	0.03	0.30
Latino	0.20**	98	0.07	0.33
Adjusted-R^2	0.573			
* p<0.05, **p<0.01, ***p<0.001				

Table 37: Impact Academy (Hayward)

Productivity (CST ELA)		N	95% C.I.	
All	0.18***	249	0.12	0.24
Parents, no college	0.20**	70	0.07	0.33
Free/Reduced lunch	0.23***	116	0.14	0.32
African American	0.17*	55	0.04	0.29
Latino	0.19**	93	0.09	0.30
Adjusted-R2	0.705			
Productivity (CAHSEE ELA)		**N**	**95% C.I.**	
All	0.14*	124	0.04	0.23
Parents, no college	0.20*	35	-0.01	0.40
Free/Reduced lunch	0.21**	58	0.04	0.37
African American	0.18	27	-0.05	0.40
Latino	0.16	47	-0.03	0.35
Adjusted-R2	0.660			
Productivity (CAHSEE Math)		**N**	**95% C.I.**	
All	0.21***	122	0.10	0.32
Parents, no college	0.12	35	-0.02	0.27
Free/Reduced lunch	0.33***	56	0.16	0.49
African American	0.40**	27	0.12	0.68
Latino	0.18	45	0.02	0.33
Adjusted-R2	0.605			
* p<0.05, **p<0.01, ***p<0.001				

Appendix B:
A-G Course Requirements

Type of Requirements	History	English	Math	Laboratory Science	Language other than English	Visual and Performing Arts	College Prep Elective and PE
A-g	3 years (including 1 year U.S. History and 1 semester U.S. Government	4 years (college prep)	3 years (including Algebra I, II and Geometry)	2 years (including Biology, Chemistry and Physics)	2 years	1 year	1 year (only qualifying classes)

scope
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