Why We Need a State & Regional Approach to Higher Education in Silicon Valley
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Postsecondary education and the San Francisco (SF) Bay Area economy are varied and complex – and they are integral to each other’s success. Colleges and universities of all types educate and train a diverse workforce, and Silicon Valley employs highly skilled workers. Faculty and graduates serve as innovators and entrepreneurs; industrial labs push the boundaries of research and knowledge. These two “fields” share important values, including a keen interest in developing and using knowledge and a reliance on networks of professionals.

Yet higher education and the Bay Area economy are mismatched in many ways, and ill-suited for each other. The two fields have developed under different conditions, with different pressures, for different purposes, and so it is not surprising that they differ substantially in their values, norms, and pace of change. Most colleges developed in the 19th or 20th centuries and adopted bureaucratic structures that provide discretion to academic professionals. In colleges, the pace of change has been leisurely. In contrast, Silicon Valley has renewed itself multiple times in the past half-century, creating an industrial model that features an array of nimble, independent companies that rely on each other; a high degree of labor mobility across companies; and expertise and partnerships cobbled together to meet new challenges. In Silicon Valley, change is fast-paced.

Why the Mismatch Between Colleges & the Economy Matters

The mismatch between postsecondary education and the Bay Area economy is important to address because it threatens the supply of skills and knowledge needed for economic growth and civic vitality in the region. Without the skills and knowledge of its workforce, Silicon Valley would not be the economic engine that it is today. In examining postsecondary education in relation to the regional economy, we looked at the full range of higher education institutions in the SF Bay Area: research universities, comprehensive colleges and universities, baccalaureate colleges, community colleges, special-focus institutions, and for-profit entities. In particular, we were interested in broad-access public institutions, both two- and four-year. Within colleges, we focused on four areas due their importance to the Bay Area economy: computer science; biology and biotech; business and business administration; and engineering.

Challenges facing higher education throughout California and especially for the San Francisco Bay Area include the following:

- Poor student preparation for college, as witnessed in high remediation rates in the California State University (39 percent) and the California Community Colleges (70-80 percent) (CSU 2016).
Inadequate supply of higher education to meet changing student demographics, contributing to insufficient opportunities for students (see Exhibit 1).

Increasing tuition rates and students’ increasing inability to pay off their student debt (Institute for Research on Higher Education 2016).

Projected labor shortages and skills gaps for workers and industry (Public Policy Institute of California 2016a).

Exhibit 1. Inadequate Supply of Higher Education at California’s Public Universities

The mismatch is also important because colleges and universities are no longer as insulated as they have been from wider societal forces. Differences exist among types of colleges and universities, but historically, most postsecondary institutions have given higher priority to academic subjects than to applied subjects and to real-world experience. More and more, postsecondary institutions are experiencing pressure to shift their energies toward preparing their graduates to contribute to the workforce and the economy. This pressure is coming from:

- Changes in societal norms, in which higher education is increasingly viewed as a private rather than a public good,
- Changes in funding, in which federal and state funding of public colleges and universities have not kept pace with student demand,
- Political and policy changes, in which many public officials expect postsecondary education to be more accountable for student outcomes, and

The mismatch between postsecondary education and the Bay Area economy threatens the supply of skills and knowledge needed for economic growth and civic vitality.
• Changes in student demographics and needs, with student populations that are older, more diverse, employed, with families, rotating among postsecondary institutions (“swirling”), and returning to retrain themselves throughout their careers.

In short, a major sorting out is underway concerning what criteria are to prevail in making colleges and universities effective leaders in the 21st century, and the San Francisco Bay Area presents a case study of these pressures and opportunities. Based on our examination of a wide range of postsecondary institutions in this region since 1970, colleges and universities are attempting to uphold academic standards while striving to respond to the demands of a rapidly changing market economy. Several patterns have emerged as to how Bay Area colleges and universities have adapted:

• Adjusting administrative and faculty leadership (including the hiring of adjuncts),
• Offering more vocational programs (including through extension centers),
• Building bridges with industry (for example, through internships and advisory boards), and
• Creating more flexibility in college systems (for example, through online programs).

These strategies vary across colleges and within them (for example, among schools and departments), although colleges reported significant internal and external barriers to adaptation. Given the challenges facing higher education, these strategies, while promising, have been insufficient to meet the needs of the SF Bay Area. They have not substantially transformed course delivery; bridged the divides among K-12, higher education, and jobs; or improved transfer among the public systems of higher education. In some ways, for-profit and corporate colleges are filling gaps that are left unaddressed by public institutions, due to the many pressures and constraints the public colleges face, including decreased state funding. As the president of a public university in the Bay Area said, “The regional economy changes exponentially, but my university can only change incrementally.”

Through this report, we hope to begin a conversation that takes a broad view of the relationship between higher education and the economy – not one rooted exclusively in the internal functions of colleges and universities, or in the demands of employers. The implications for higher education policy are substantial, including changes needed at the state level (to improve coordination, information gathering, and oversight) and the federal level (for example, to make federal student aid responsive to the needs of older students and those returning for retraining). But Bay Area leaders cannot wait for the state or federal government to act on its behalf. We conclude by calling for the development of a regional agenda for education policy in the Bay Area, and a new regional entity to develop a vision and see it through.

About Our Study

Observations in this report are drawn from our study at Stanford University, which looked well beyond the common scope of higher education research. Colleges and universities are integral to the economies of their regions, and our study explored the interactions between the Bay Area’s higher education institutions and its economy. The study focused on colleges and universities, rather than students, and used an organizational field perspective (Scott 2014). Through this approach, we
What’s Different about Our Study?

Organizational field perspective. We examined postsecondary education in the SF Bay Area as operating in two fields: a sectoral one (postsecondary education) and a regional one (the Bay Area economy). The units of study are organizations rather than students.

Regional approach. Many studies consider postsecondary institutions in relation to their peers nationally. Our study examined colleges and universities in the context of one metropolitan region.

Broader range of postsecondary institutions. Many studies concentrate on research universities or selective colleges. Our study includes a wide range of institutions, featuring broad-access two- and four-year institutions, which serve the majority of students in the United States, as well as nonprofit and for-profit institutions.

Longer timeframe. Most studies concentrate on changes occurring over relatively short periods of time. Our examination spans several decades, from the 1970s to today.

These institutions have been frequently over-enrolled and under-funded, and subjected to financial and administrative constraints that prevent them from fully responding to the needs of regional and national economies. They warrant attention now more than ever. We were also interested in for-profit entities, which have garnered significant public attention over the past decade but have not been studied sufficiently. Within colleges, we focused on four areas salient to the Bay Area economy: computer science; biology and biotech; business and business administration; and engineering.

To understand changes in the ecology of the organizations providing higher education services, our study took a longitudinal approach, integrating data from interviews, statistical analyses, and institutional documents that covered more than 45 years, beginning in 1970. Our research examined the effects of the larger historical context (including demographic changes, policy decisions at federal and state levels, administrative structures, and sources of revenue) and the internal changes within colleges during this period (including the types of faculty employed, the academic programs offered, and the types of graduates who emerged).
The Bay Area hosts roughly seven million residents and is anchored by four cities: Oakland in the east, San Francisco to the north, San Jose in the south, and Santa Cruz to the southwest. The metropolitan area is relatively compact, but addressing it as a single entity would be misleading. As a result, we divided the region into three sub-regions, each of which has its own ecology of industry and higher education, as well as its own demographic patterns. The sub-regions were:

1. **The South Bay**, which includes Santa Clara County (including San Jose, the heart of Silicon Valley) and Santa Cruz County;
2. **Greater San Francisco**, which includes San Francisco, San Mateo, and Marin counties; and
3. **The East Bay**, which includes Alameda County (Oakland) and Contra Costa County.

For each sub-region, we identified a range of college types and conducted a case study for each type (see Exhibit 2). This sub-regional approach helped us to identify the types of colleges that adapted to meet the changing needs of local employers; the adaptive strategies those colleges employed; the patterns and differences within and across college types and sub-regions; and the barriers colleges faced in adopting the strategies.

### Exhibit 2. Sub-Regions and Case Study Schools

<table>
<thead>
<tr>
<th>Sub-region</th>
<th>Public 4-year</th>
<th>Public 2-year</th>
<th>Nonprofit</th>
<th>For-profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>The South Bay</td>
<td>San Jose State University</td>
<td>Foothill College</td>
<td>Menlo College</td>
<td>DeVry University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evergreen Valley College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater San Francisco</td>
<td>San Francisco State University</td>
<td>City College of San Francisco</td>
<td>Golden Gate University</td>
<td>Academy of Art</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skyline College</td>
<td></td>
<td></td>
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<tr>
<td>The East Bay</td>
<td>California State University East Bay</td>
<td>College of Alameda</td>
<td>Holy Names University</td>
<td>University of Phoenix</td>
</tr>
</tbody>
</table>

### The Ecology of Postsecondary Education in the San Francisco Bay Area

Most people do not know that the SF Bay Area is home to so many postsecondary institutions: over 350 as of 2012. There are many more nonprofit and for-profit providers than public colleges and universities (see Exhibit 3). This is partly because public data sources provide an incomplete picture of the postsecondary landscape. For the Bay Area, the Integrated Postsecondary Education Data System (IPEDS) omits over 60 percent of private nonprofit institutions (e.g., National College of Technical Education) and about 80 percent of private for-profit institutions (e.g., Northern California Nursing Academy).

The diversity of postsecondary institutions provides multiple entry points and career paths for students, as well as many styles of education. However, the paucity of public data about most private colleges makes it difficult to accurately gauge enrollments and outcomes across institutions and by institution type.
<table>
<thead>
<tr>
<th></th>
<th>Multiple data sources</th>
<th>IPEDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Four-year and above</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Two-year</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Nonprofit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Four-year or above</td>
<td>78</td>
<td>37</td>
</tr>
<tr>
<td>Less than two-year</td>
<td>38</td>
<td>4</td>
</tr>
<tr>
<td>For-profit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four-year or above</td>
<td>36</td>
<td>13</td>
</tr>
<tr>
<td>Two-year</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Less than 2-year</td>
<td>176</td>
<td>22</td>
</tr>
</tbody>
</table>

Note: Because data from the Integrated Postsecondary Education Data System (IPEDS) are restricted to colleges that are degree-granting, accredited, and qualify for federal student loans, they omit most nonprofit and for-profit institutions. Sources: Data retrieved from IPEDS, California Postsecondary Education Commission, Bureau for Private Postsecondary Education, college websites, and other sources.

Based on the limited data we do have, public colleges and universities appear to account for the bulk of student enrollment in this region (see Exhibit 4). Enrollments are substantially higher in public community colleges than in all other types of colleges in the Bay Area combined. Community college enrollment increased sharply between 1970 and 1980 – during budget surpluses – and the number of public community colleges increased somewhat from 1970 to 1990 (Callan 2014) (see Exhibit 5). Nonetheless, the number of public institutions has held fairly constant since 1970. Exhibit 5 underreports the number of private nonprofit and for-profit institutions, but its depiction of the volatility in this sector appears to be accurate.
Exhibit 4. Postsecondary Enrollment in the SF Bay Area by Level and Control, 1970 to 2012

Notes: IPEDS data omit most private nonprofit and for-profit institutions. Data were unavailable for the for-profit sectors (two-year and four-year) for 1990; thus, the figure reflects 1989 data for these sectors. Data were also missing for 1980 and 2012 for the two-year for-profit sector, so the figure represents enrollment for 1981 and 2006. Sources: Higher Education General Information Survey (1970-1985) and IPEDS (1986-2012).

Exhibit 5. Number of Postsecondary Institutions in the SF Bay Area by Level and Control, 1970 to 2012

Bay Area colleges and universities operate within support and control structures that are diverse and complex. These structures include administrative and regulatory controls that occur at the system and state level. For example, the University of California (UC), California State University (CSU), and the California Community Colleges (CCC) each have their own complex rules and policies, many of which are imbedded in law. The for-profit institutions tend to have less bureaucratic administrative structures that are centralized in a board of directors and driven by market pressures but that impose fewer constraints on processes. In the Bay Area, the most significant for-profit entity is the Apollo Group, which owns the University of Phoenix, DeVry University, and the Education Management Corporation that operates the Arts Institutes. California regulates its private for-profit programs through the Department of Consumer Affairs, although these controls are known to be lax.

The Economy of the San Francisco Bay Area

The San Francisco Bay Area is host to Silicon Valley, a globally prominent region of technological innovation that emerged soon after World War II. Giants of the technology industry – including Hewlett-Packard, Fairchild Semiconductor, National Semiconductor, Lockheed Martin, Apple, Cisco Systems, Intel, Yahoo!, Google, and Facebook – were founded and operate in the region. In addition, venture capital firms, laboratories, intermediaries (for example, law firms and temporary employment agencies) play an important role in the innovation economy (Benner, Leete, and Pastor 2007; Randolph 2012).

The Bay Area has also retained a strong hold on conventional manufacturing industries. Helper, Krueger, and Wial (2012) report that Silicon Valley had the nation’s highest manufacturing wages and the second highest concentration of production jobs among the large cities. More than 160,000 people are working in Silicon Valley factories. In addition, growth within the innovation sector has a “multiplier effect” on jobs in other job sectors, including restaurants, health care, hotels, real estate, and transportation (Moretti 2013). The main metro areas of Silicon Valley ranked among the top big cities in the nation for job creation in 2015. The Bay Area also serves as a major motor for the state economy (Walters 2015).

The Bay Area economy has undergone substantial transformation and renewal over the past half century (see Exhibit 6). These reinventions have included the development of defense industries during and after World War II, semiconductors and mainframe computers in the 1960s, personal computers in the 1980s, internet companies through the turn of the century, social media in the early 21st century, and, most recently, the fields of bioinformatics and cybersecurity.
Colleges and universities of all types have served important roles in the regional economy during this period, including as employers themselves. Stanford and UC Berkeley in particular have been sources of ideas and human capital, and many faculty members and graduates have served as technical innovators and entrepreneurs. In 1996, start-ups involving Stanford faculty accounted for nearly 60 percent of total Valley companies (Gibbons 2000; Lenoir et al. 2004). Broad-access colleges have also played crucial roles. For example, San Jose State University graduates between 600 and 700 engineers each year, and most are employed in the Valley, according to its president. In addition, the economy requires a range of highly skilled workers and para-professionals, including software programmers, tech-savvy marketing personnel, accountants, managers, and many trained workers in support industries. Industry sub-contractors range from developer-consultants and experts on the high end to support technicians (Barley and Kunda 2004).

The thriving economy of the Bay Area rely heavily on an educated workforce. The average level of educational attainment in this region is much higher than the state, with about 46 percent of the adult population having a postsecondary degree or higher, compared to 31 percent of California adults (Massaro and Najera 2014). The largest share of educated workers are immigrants, with over 60 percent of those working in engineering and other science-related fields born outside the U.S. (Handcock, DiGiorgio, and Reed 2013). Median income in Silicon Valley is $90,000, compared with $60,000 for the state and $52,000 nationwide.
The Bay Area boundaries are highly porous and ever-changing. It is a magnet for migrants who flow in and out the region in varying numbers and from diverse origins. Partly because of skills shortages in the Bay Area, immigrant labor has become a major source of skills for many Silicon Valley companies (Pastor, Ortiz, Ramos, and Auer 2012; Saxenian 2000). Bay area industries are also connected to collaborators, partners, and subcontractors who are far afield, often across the oceans (Saxenian 2008). Economic regions exhibit a complex ecology that affects all of their inhabitants, both individuals and organizations, but they remain open systems subject to the influences of a wider environment. Similarly, research universities and comprehensive colleges and universities are oriented to connections at state, national, and international levels. By contrast, community colleges and many nonprofit and for-profit institutions tend to be more responsive to local conditions and demands as they design their offerings, even as their curricula and procedures are shaped by professional norms and state and national constraints.

The Uneasy Partnership Between Higher Education & the Bay Area Economy

Both higher education and the economy in the SF Bay Area are complex fields hosting and responding to a diverse ecology of organizational members, support organizations, professional associations, regulatory agencies, and market pressures. In comparing these fields, two common traits stand out:

1. **Knowledge.** Postsecondary institutions and Silicon Valley firms share a common interest in what is often termed a “knowledge economy.” High value is placed on expertise, information, and knowledge, although the academic institutions place more premium on abstract knowledge and the high-tech firms emphasize more applied knowledge.

2. **Professional networks.** Both fields, particularly at the upper levels, create dense interactive networks which place great value on expertise and a reputation for reliable performance. Both fields benefit from strong network ties that connect their leaders (faculty and administrators for universities, professionals and managers for industry) with wider communities through which competitors can become potential partners. Knowledge and information is shared not only within organizations but across them, fostering shared norms and values (Seely-Brown 2000: xv).

These commonalities offer a foundation upon which postsecondary institutions and Bay Area firms can address common goals, such as ensuring that graduates are prepared to succeed in the ever-changing economic climate of the Silicon Valley. However, several key differences between the two fields are striking and often serve as barriers to collaboration and to their independent, yet interdependent, success (see Exhibit 7).
Exhibit 7. A Clash of Fields

<table>
<thead>
<tr>
<th></th>
<th>Higher Education</th>
<th>Silicon Valley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance systems</td>
<td>Regulative (federal, state)</td>
<td>Markets</td>
</tr>
<tr>
<td></td>
<td>Professional norms</td>
<td>Networks</td>
</tr>
<tr>
<td></td>
<td>Process controls</td>
<td>Outcome controls</td>
</tr>
<tr>
<td>Institutional logics and norms</td>
<td>Liberal arts</td>
<td>Practical arts</td>
</tr>
<tr>
<td></td>
<td>Learning skills</td>
<td>Vocational skills</td>
</tr>
<tr>
<td></td>
<td>Theoretical knowledge</td>
<td>Applied knowledge</td>
</tr>
<tr>
<td></td>
<td>Preservation</td>
<td>Disruption</td>
</tr>
<tr>
<td>Prime beneficiary</td>
<td>Public good</td>
<td>Private interests</td>
</tr>
<tr>
<td>Stage of development</td>
<td>Mature</td>
<td>Early, formative</td>
</tr>
<tr>
<td>Time horizon</td>
<td>Centuries, decades</td>
<td>Years, months</td>
</tr>
<tr>
<td>Pace of change</td>
<td>Deliberate</td>
<td>Rapid</td>
</tr>
</tbody>
</table>

First, the fields differ in the control mechanisms their respective organizations confront. Colleges and universities are subject to regulatory controls by public agencies, including constraints at the federal, state, regional, and local levels. These controls emphasize conformity regarding curricula, qualifications of faculty, accountability for public funds, and attention to the rights of students. Postsecondary institutions also face normative controls by academic and professional associations, including accreditation bodies. These pressures involve adherence to standards through the existence of specific structures (for example, library and faculty qualifications) or processes (for example, program alignment and accounting procedures). For higher education, process and input controls are relied upon heavily, whereas measures of outcomes (for example, graduation rates) have been employed less widely.

By contrast, businesses and corporations in the Bay Area are subject to some federal and state tax requirements, environmental regulations, and rules concerning labor and consumer relations, but they are primarily governed by outcomes defined by the market. These market controls take a variety of forms, including simple measures of outputs, sales, or growth and more complex ratios assessing value added, such as productivity or return-on-investment (ROI) metrics. For publicly traded companies, the ROI measures are usually assessed quarterly.

The two fields are also governed by contrasting institutional logics and norms (see Gumport 2000). Organizations in each of the two fields value knowledge, expertise, and creativity, but with different levels of emphasis. Colleges and universities have been shaped and are influenced by the historical legacy of academic traditions spanning centuries. They perceive themselves as the custodians and curators of the knowledge and cultural heritage of the past, including philosophical and scientific constructions and languages and literatures. They have long emphasized their contribution to the public good: preparing informed and thoughtful citizens and members of society.

Colleges and universities have been shaped and are influenced by the historical legacy of academic traditions. Businesses and corporations in the regional economy are much more oriented to market logics.
Scientific studies are undertaken to broaden understanding of the how the world operates and to expand the frontiers of knowledge, not necessarily because of their applications to specific problems or short-term benefits. There is respect for tradition, as symbolized in the rituals of graduation and investiture. This academic logic varies greatly among the different types of colleges. Still, there remains a strong core of belief that colleges and universities are the keepers and protectors of a precarious value: the preservation and enhancement of the stock of common knowledge, the wisdom of the ages. Colleges tend to view students as clients whose needs should be diagnosed and addressed, not as customers whose preferences are to be served.

Businesses and corporations in the regional economy are, of course, much more oriented to market logics. They are guided by the changing tastes and demands of their consumers and by the opportunities afforded by innovation. They turn to colleges and universities for help in solving specific problems and to obtain qualified workers who can contribute to their research, development, and production systems. They value creativity and knowledge insofar as it leads to commercial products and services.

Finally, higher education and the Bay Area economy operate under different timeframes. Postsecondary education is engaged in the pursuit of enduring truths. It views itself as part of a centuries-long effort to accumulate and test knowledge; to cultivate the humanities and arts; and to pass on this heritage by educating and socializing students. Education takes time, and the production schedules of colleges and universities are measured in years – four for a bachelor’s degree, and more for a graduate degree – and in semesters or quarters. Colleges pursue missions over the long-term and they are slow to react in developing new programs or adjusting existing programs to changing conditions. At the community colleges, it typically takes two to three years to obtain state approval for new program start-ups.

In contrast, high-tech companies in the Bay Area are subject to strong competitive forces to be first to market with an improved product or service. Their production systems are expected to rapidly respond to changes in market signals, consumer demand, and quality control. The companies and their employees must thrive in a world of high energy, uncertainty, and transience. It is a world of flux in which boundaries are reconfigured, workers redistributed, and alliances reformed. Firms are primarily valued for their facility to respond quickly to new challenges (Lewis 2000).

**Broader Forces Shaping Higher Education & the Regional Economy**

Several external forces are adding to the pressures that Bay Area colleges and universities are facing, including the following.

**Demographic changes at the regional level.** Demographic challenges include those posed by increased diversity in types of students – by ethnicity, language, age, full- and part-time, and lower academic preparation. The SF Bay Area nearly doubled in size from 1970 to 2010, growing more rapidly than the rest of California or the nation as a whole. Immigrants were an important part of this growth and the region became much more diverse. From 1980 to 2010, white residents declined
from 3.6 to 3.0 million and the number of blacks remained largely unchanged at half a million. Hispanic populations increased from 600,000 to 1.7 million, Asian/Pacific populations from 400,000 to 1.7 million (U.S. Census). Hispanics have much lower rates of degree attainment than Asians. During this turbulent period, the state has failed to expand research and state universities as rapidly as necessary to meet increasing population demands (Callan 2009).

Organizational challenges at the societal level. Although colleges are sequentially interdependent with K-12 schools, there is a chasm between secondary and postsecondary education in the United States. The starkest indicator of this misalignment is the number of incoming college students requiring remediation. About 70 percent of students entering California’s community colleges require some remedial classes. Roughly 30 percent of all English and math courses offered by these colleges are remedial (Cohen and Brawer 2003).

Political and economic forces shaping higher education. During the study period, federal and state policy saw three major trends: (1) a persistent focus on expanding access for students; (2) attempts to address increasing educational costs, although state efforts were erratic and inadequate and federal efforts failed to keep pace; and (3) more recent efforts to hold colleges accountable for meeting student and market needs. Successive recessions have brought financial stringency and severe restrictions in college access in California, principally in the CSU and CCC systems. Colleges have responded by increasing tuition and fees in all three tiers (Callan 2009) (see Exhibit 8).

Technological changes, especially changes in information and communication technologies. Online education opportunities, student support tracking and alerts, open educational resources, Massive Open Online Courses (MOOCS), personalized learning tools, and other technological changes offer promise in transforming the learning experience, but they have not yet reshaped higher education delivery and support systems substantially.

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Exhibit 8. Average Tuition and Fees per FTE Students at California’s Three College Systems, 1977 to 2014 (in 2013 dollars, adjusted for inflation)

Image used with permission from Randolph and Johnson (2014)
Colleges’ Adaptive Strategies Amid Budget & Other Pressures

Given the mismatch between postsecondary education and the economy in the Bay Area, we sought to determine how these two fields found ways to connect and collaborate to meet common goals. We were able to address this by examining how the various colleges in sub-regions within the Bay Area have adapted – or not adapted – to market and other factors.

Exhibit 9. General State Appropriations per FTE Students at California’s Three College Tiers, 1977 to 2014 (in 2013 dollars adjusted for inflation)

Image used with permission from Randolph and Johnson (2014)

Change comes slowly to these large institutions, and fiscal and other constraints are making it difficult for them to serve their multiple missions. Most funding of public higher education is incremental; the state, typically, makes annual additions to base funding without examining the base. The ability of colleges to adapt to changing demands has been affected by uneven and declining state support (see Exhibit 9). In the Bay area, state funding for colleges and universities has failed to keep pace with demographic changes and increasing student demand; the region’s low number of state universities, in particular, are inadequate to meet the needs of its population centers. Space is often unavailable for qualified transfer students seeking to enter four-year programs, and many of the most popular two- and four-year programs are “impacted” – that is, they are unable to accept new enrollments. In addition, vocational programs (from nursing to mechanics) tend to cost more to operate than humanities programs, yet state funding is based on enrollment by postsecondary system, not by program. This funding policy incentivizes colleges to restrict enrollments in many high-demand workforce programs.

Meanwhile, many nonprofit colleges in the Bay Area have become more specialized in vocational areas. For instance, over time Menlo College has increasingly focused on business administration, Golden Gate has expanded course offerings in law, and Holy Names University has bolstered their nursing and education credential programs. The for-profit schools have long prioritized local vocational needs.

During the period of our study, all types of colleges moved to embrace a more vocationally oriented curriculum.
Compared with the public systems’ more complex and fragmented structures, the for-profit colleges’ centralized and de-professionalized structures enable them to be more responsive to changing employment conditions. For-profits are approved and overseen by the State Bureau of Consumer Affairs, and they are subjected to fewer external controls, which has helped them be more flexible but has also led to other problems. For example, some for-profits have overpromised results, understated requirements, or overreached in other ways, which has called into question their standing as reliable providers of quality higher education.

In looking across Bay Area colleges and universities of all types and across the sub-regions, we identified several patterns as to how the institutions sought to respond to market pressures.

Adjusting administrative and faculty leadership. Colleges and universities are placing a premium on hiring and retaining leaders who can craft and communicate a compelling vision to compete for students and funding. This includes marketing a customized mission—a brand—to set their college apart from others. For example, San Jose State University has adopted “Fueling Silicon Valley” as their official motto.

In addition, college administration has become larger and more centralized over the past decades, as the proportion of tenured faculty declined. In every college type in the Bay Area, the ratio of non-tenure-track to tenure-track faculty has increased since 1995. These figures reflect increasing cost-consciousness: adjuncts are much less expensive than regular faculty. Adjuncts also provide colleges with flexibility in responding to the economic shifts in the Bay Area. But these trends also reflect the diminishing role of faculty in setting institutional priorities. In addition, there are important differences by college type. For-profit colleges, for example, have never hired many tenure-track faculty, which enables them to shift teaching programs (and let go of faculty) based on market demands.

Research universities and comprehensive colleges develop complex differentiated administrative arrangements allowing some programs to pursue primarily academic programs whereas others focus on vocational programs or more innovative efforts such as digital education. Senior managers of these colleges are compelled to cultivate “ambidexterity” – overseeing programs that serve diverse goals and require different practices (Tushman and O’Reilly 2011).

Increased numbers of vocational education and extension programs. Many colleges and universities also adopted strategies to bolster their vocational and workforce offerings, including by the development of autonomous extension programs. The number of degrees granted by all types of colleges reflected a substantial shift from liberal arts programs (such as the humanities, natural and social sciences) and toward vocational and applied programs, including professional and para-professional programs. In public four-year colleges and universities, the share of liberal arts degrees (compared with total certificates and degrees) conferred declined from 42 percent in 1974 to 30 percent in 2010. In nonprofit four-year colleges, the share of liberal arts degrees declined from 42 percent to 31 percent (see Exhibit 10).

As record numbers of high school students are applying to state colleges and universities, more are also receiving hands-on training in high-demand technical careers even before they earn their diplomas. The students, many beginning in the 9th grade, are in career pathways learning job skills.
alongside professionals in fields including aviation, healthcare, civil engineering, fashion design, tourism, and new media. These pathways, which integrate academics with real-world work experience, are being fueled by California’s unprecedented investment in career technical education. The state is pouring more than $1.5 billion over five years into programs aimed at establishing and strengthening partnerships between K-12 schools, community colleges, and businesses to better prepare students for college and careers.

Exhibit 10. Number of Degrees Conferred, Liberal Arts and Sciences vs. Occupational and Professional, 1974, 1990, and 2010

Over the past two years, the nearly $500 million Career Pathways Trust has awarded grants to 79 school districts, county offices of education, community colleges, and charter schools. The state also approved an additional $900 million in Career Technical Education Incentive Grants last year, which will be awarded to dozens of districts and other agencies over the next three years to accelerate new program development. About a half dozen smaller grant programs are also helping drive California’s growth in career technical education. However, these initiatives are one-time state funds, and it is unclear whether they can be locally sustained. The state K-12 education code contains only a few general phrases about state CTE policy, and the attempts to provide a more integrated K-12 and postsecondary focus are just beginning.

Building bridges with industry. Many colleges and universities sought ways to collaborate more extensively with companies, primarily to keep up to date with industry changes, attract new students, and place existing students. In the 1980s, colleges received equipment from companies, but this proved unworkable as technology changed rapidly. Colleges have also provided contract courses to corporations, but this has decreased as companies have provided their own trainings. Nationally, the number of employees who have their tuition paid for by the employers dropped from approximately 70 percent in 2005 to 40 percent in 2015 (The Economist 2015) because of increased use of company-based training. Recent efforts to connect with industry feature:

- The development of internship and apprenticeship positions within colleges. The former is more common for semi-professional and technical training (such as nursing and dental hygiene), the latter for manual positions (such as plumbing and automobile mechanics).
• The creation of advisory boards, in which industry representatives meet regularly with college administrators and faculty to provide advice and assistance on courses and programs.

• The use of social networking sites, such as LinkedIn and Monster.com, to connect students and graduates with prospective employers. This has coincided with a shift away from reliance on career service centers, due partly to funding constraints and partly to the advent of technological platforms for job seekers.

• Participation in organizational networks such as Linked Learning and the California Career Pathways Trust, both of which support transitions from K-12 schools to postsecondary education to jobs.

Creating more flexibility in college systems. In competing for students, colleges have faced pressures to become more flexible in their program offerings, enrollment policies, and course delivery options. Strategies have included the delivery of online courses and programs and developing more diverse emblems of achievement, such as badges and certificates. The academic calendar has remained largely unchanged, but colleges and universities have made adjustments through intermittent enrollment policies and extending hours and the locations of classes. For-profit and nonprofit private institutions have been more nimble in these areas. For many of the public systems, most of the action has occurred in selected professional schools (such as engineering and business) or in extension programs, but their changes are measured in years and decades, not days or months.

California’s Outdated Patchwork of Postsecondary Policy

Traditional academic norms and structures were never designed to keep up with a fast-changing and rapidly growing regional economy like the Bay Area, and fiscal restraints have made it more difficult for public institutions to address their multiple missions. Inequitable opportunities and inadequate supply in a wide spectrum of college programs, from liberal arts to technical education. Recent high school graduates and middle-aged adults struggle to find the educational options they want, and companies face labor shortages in critical areas (Public Policy Institute of California 2016a). Only three comprehensive California State Universities (CSUs) exist in a region with over seven million people.

The San Francisco Bay Area, with 20 percent of California’s population, has generated well over half of the state’s employment growth since 2007, by adding 600,000 new jobs. Los Angeles County, with 25 percent of the population, has produced less than 10 percent of the new jobs (San Jose Mercury News: 1). The demography of the Bay Area has also changed as immigrants have been drawn to the region. The Bay Area had over 350 postsecondary institutions in 2015, yet has experienced

The community colleges and CSU’s have been frequently over-enrolled and under-funded, and subjected to financial and administrative constraints that prevent them from fully responding to the needs of regional and national economies.
We found that colleges have adopted a range of strategies to address changing student needs in the SF Bay Area but that implementation has been uneven across institutions and insufficient to meet the region’s needs. Increasing numbers of students are taking the courses required for university enrollment (see Exhibit 11), but Bay Area universities are not meeting demand. Their adaptive strategies have not substantially transformed the delivery of courses; bridged the divides among K-12, higher education, and jobs; or resolved the difficulties students face in transferring credit among the public systems of higher education. Traditional academic norms and structures were never designed to keep up with a fast-changing and rapidly growing regional economy like the Bay Area, and fiscal restraints have made it more difficult for public institutions to address their multiple missions.

Exhibit 11. Percentage of High School Graduates Who Completed the A-G Course Sequence Required for Enrollment at UC and CSU, SF Bay Area and California

Neither the state nor the region has a strategy to address the regional findings in this report, or an estimation of the level of postsecondary investment needed to meet regional academic and vocational demands. No state or regional entity attempts to coordinate or steer the collection of what are, in practice, at least seven separate and isolated postsecondary systems: the three public systems, the private nonprofit institutions, the for-profit colleges, the adult education programs offered by K-12 schools, and the Workforce Investment Boards run by the State Employment Department. California’s Master Plan, adopted in 1960, set up a patchwork of individualized policies for each of the three public systems, but not a framework for coordinating educational improvement (Finney, Riso, Orosz, and Boland, 2014). The state’s coordinating agency, the California Postsecondary Education Commission (CPEC), was dissolved in 2011. Nonetheless, there are state institutions – including the Governor’s Office and the Legislature – that can address statewide postsecondary policy. At the regional level in the Bay Area, there is no such institutional base.
Action Needed at State, Federal, & Regional Levels

The purpose of this report is to begin a conversation in California – at the state and regional levels – about how to address the challenges facing postsecondary education regionally, and specifically in the SF Bay Area. Regional studies are important but relatively neglected in the field of education. Likewise, education planning and policy at the regional level are overlooked and undervalued. We believe that policymakers cannot expect to change a few policies and resolve the postsecondary challenges facing the Silicon Valley. Addressing these issues will likely require policy action at the federal and state levels – as well as planning and action at the regional level.

State & Federal Policy

California’s higher education policy environment, which is the product of historical compromises and incremental decisions, has led to the stagnation of postsecondary education. This patchwork quilt is still based on the 1958 Master Plan, which was the envy of the nation for many years. The state steering role for all of California public and private postsecondary sectors, however, has not been developed to meet current and future challenges. As others have reported, each of the three public segments in California develops separate, individual policies based on its own goals. Statewide goals that can be reached by a single segment can achieve excellence, but primarily those that require collaboration across the segments fall through the cracks (Richardson and Martinez 2009; Finney et al. 2014). The state does not include any private institution in its planning; its plans for K-12, postsecondary, and Career and Technical Education (CTE) need updating and integration; and its information systems are inadequate to provide a detailed view of how students swirl between public and private systems – all of which limit the state’s ability to develop strategies and policies that facilitate successful student outcomes. In light of these challenges, we suggest that the state needs stronger capabilities to steer and coordinate postsecondary education. Based on our regional study, we suggest several areas of focus including the following:

1. CSU enrollment in computer science, biology, business, engineering, and STEM fields are at capacity in many Bay Area institutions.
2. State cuts enrollment during recessions, at a time when student demands for postsecondary education heightens.
3. The state needs to develop more proactive and comprehensive strategies for vocational and occupational education in general, and Career and Technical Education (CTE) need updating and integration; and its information systems are inadequate to provide a detailed view of how students swirl between public and private systems – all of which limit the state’s ability to develop strategies and policies that facilitate successful student outcomes. In light of these challenges, we suggest that the state needs stronger capabilities to steer and coordinate postsecondary education. Based on our regional study, we suggest several areas of focus including the following:
4. The state needs better data and information about student enrollment and progress within and across postsecondary institutions generally, and at private institutions specifically.
5. The state needs better approval processes and oversight of its for-profit colleges.
Our study did not focus on the federal role, but three primary concerns emerged from our analysis at the regional level.

1. Federal student aid can do a better job of addressing the needs of those seeking retraining. The system does little to support older students or those returning to postsecondary education. It is also poorly aligned with the needs of students seeking credentials or specific job skills.

2. The federal government’s role in coordinating regional accrediting institutions needs to be reexamined. Accreditation is fragmented, duplicative, and overly focused on processes and inputs – and it is not well aligned with many components of skills training and with new forms of credentials, such as badges. In particular, employers can play a role in rethinking accreditation for adult education.

3. The federal Higher Education Act has not been reauthorized since 2008. The reauthorization needs to create more coherence with the Workforce Innovation and Opportunity Act and with the Perkins Career and Technical Education Act.

A Regional Policy Agenda & Entity

Given the postsecondary challenges presented in this report, we believe that Bay Area leaders cannot wait for federal and state leaders to take action on their behalf. We suggest, rather, that Bay Area leaders begin by developing a regional agenda and creating a new regional entity focused on addressing the challenges facing postsecondary education in the Bay Area. So far, regional higher education problems in California have taken a back seat to K-12 education, transportation, housing, and environmental issues. This should not continue.

Bay Area Agenda. An effective agenda-setting process identifies a range of problems that require policy attention, determines which issues deserve the most attention, and defines the nature and context of the issues to be addressed. The findings in this report provide an expansive and integrative framing for this agenda-setting process, one that highlights as central challenges: inequitable education opportunities, inadequate supply of postsecondary education, colleges that cannot keep up with changing demands, and labor shortages and skills gaps.

Bay Area Entity. To follow through with this agenda-setting process, a new regional entity is needed to advance policy discussions about the Bay Area’s education institutions and to plan next steps in coalition-building and action. Similar umbrella organizations exist in the Bay Area for coordinating regional approaches to the environment, transportation, local government, and other domains – but not for education. Regional leadership groups such as the Silicon Valley Leadership Group (SVLG) and the Bay Area Council are possible initiators of a process. Another example includes the California Economic Summit, first organized in 2012. In addition, two Bay Area agencies could serve as models for development of a regional education entity: the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC).

The purpose of the regional entity would be to establish a strategic vision for K-16 and adult education in the region and to coordinate stakeholders to enact this vision. In the process, this resource would leverage networks among K-12, postsecondary institutions and employers, gather
and share data about workforce needs and postsecondary institutions, and advocate for effective policy tailored to the Bay Area’s context and needs.

The San Francisco Bay area is a vibrant entrepreneurial and education center. It is a region rich in opportunity and challenge, with deep resources of talent and innovation. State and national leaders can take steps to adjust state and federal policy to meet the challenges of regional 21st century economies. Meanwhile, we believe that the Bay Area needs its own structure and platform for regional education planning and policy action. This report can provide an expansive and integrative framework for such work. The SF Bay Area needs a strategic vision for postsecondary education in the 21st century. In working together to develop and achieve that vision, Bay Area leaders can provide a model for action for other regions, a sense of urgency for better state and federal higher education policy, and greater educational opportunities for California residents.
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