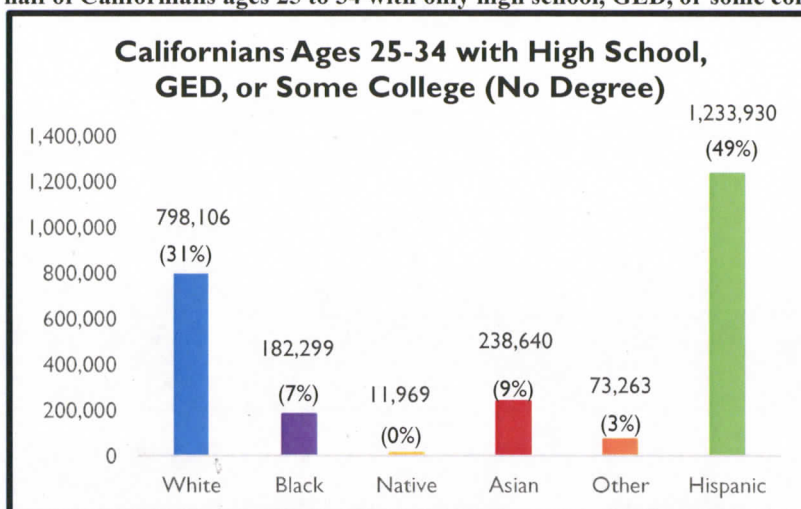


# Online Community College Proposal

## Key Challenges and Opportunities

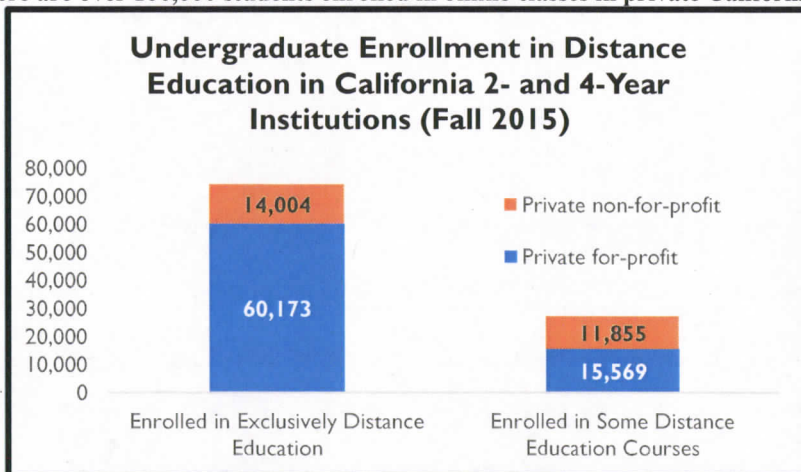
According to the U.S. Census Bureau, there are currently 2.5 million Californians ages 25 to 34 whose highest educational attainment is either high school or some college<sup>1</sup> at the same time that a growing number of middle class jobs require increased education and training. About 80 percent of these economically and educationally stranded adults are working,<sup>2</sup> and 49 percent of these adults are Hispanic.<sup>3</sup> Despite the essential nature of postsecondary education, many of these adults are unserved or underserved by higher education in California and could benefit from more high-quality, affordable, and flexible opportunities to acquire the knowledge and skills needed to achieve greater economic and social mobility.

Figure 1. Nearly half of Californians ages 25 to 34 with only high school, GED, or some college are Hispanic<sup>4</sup>



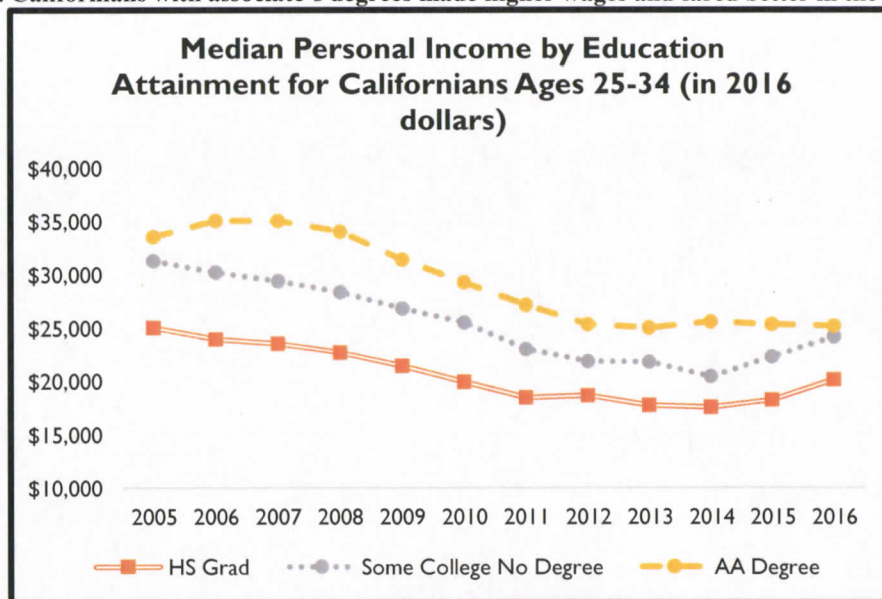
The development of an online college with programs that are compatible California's workforce needs could provide working adults with flexible educational opportunities that can increase their wages and improve their economic mobility. Creating these opportunities also ensure working Californians have an alternative to high-cost online credentials, certificates, and associates degrees offered by non-public, sometimes unaccredited, and out-of-state institutions that can cost 7 to 9 times more per unit than the California Community Colleges<sup>5</sup>, which can leave many Californians with burdensome debt and poor employment outcomes.

Figure 2. There are over 100,000 students enrolled in online classes in private California institutions<sup>6</sup>



High-quality, affordable, and flexible educational options are also critical to many individuals who were displaced by job losses triggered by the Great Recession, where corresponding growth during the recovery did not equitably restore access to new jobs. Californians have had a difficult time recovering from the Great Recession, but those with an associate's degree made more money and fared better in the recovery than those with only a high school degree or some college.<sup>7</sup> Labor force participation remains low among the working age population, and economists believe this is partially due to a skills mismatch. According to data from the Economic Policy Institute, 60 percent of jobs created during the economic recovery (2010-2014) went to men versus 40 percent of jobs that went to women.<sup>8</sup> Additionally, research from the Georgetown University Center on Education and the Workforce shows the availability of good jobs for workers without bachelor's degrees are shifting from traditional blue-collar industries to skilled-services industries that tend to require at least some postsecondary education and training.<sup>9</sup> Coupled with data from Burning Glass demonstrating that more than 8 in 10 middle-skill jobs require digital skills, key individuals left out of the recovery can benefit from both greater educational opportunity and digital skills that can be acquired through effective online modalities.<sup>10</sup> California is currently at unemployment levels only seen near the end of an expansion. The risk of economic uncertainty from a recession and other economic factors underscore the importance of increasing working adults' access to higher education.

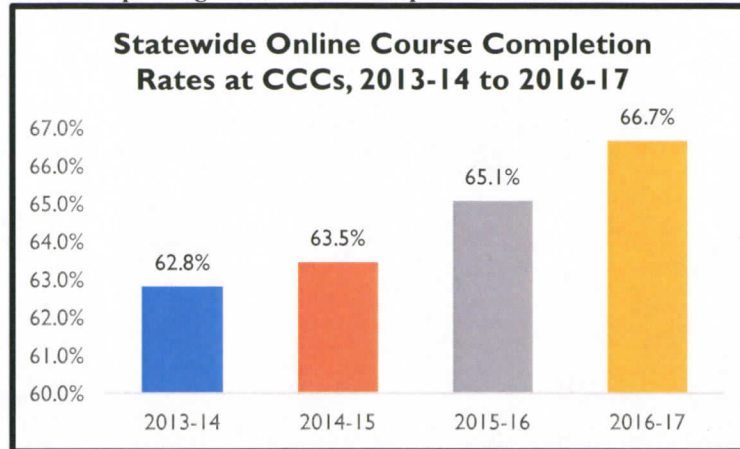
**Figure 3. Californians with associate's degrees made higher wages and fared better in the recovery<sup>11</sup>**



To date, California does not offer a flexible online experience that is designed to address the unique and diverse needs of students and that ensures program offerings are leading to knowledge and skills needed to succeed in the current and future workforce. Current online education initiatives that exist in California have helped to increase the number of courses offered online and supported professional development for developing and teaching online courses. However, these initiatives by design are not a substitute for comprehensively addressing system-wide barriers needed to effectively serve working Californians. Supporting strong outcomes for working adults requires a new approach designed around reducing barriers to successful knowledge and skills acquisition. Through the launch of a new, fully online college, the state has an opportunity to meet this challenge by providing structure and flexibility inherent to online education and other non-traditional classroom-based settings, leveraging the growing research base of learning sciences in program design, and testing and customizing non-academic supports needed to help ensure success.



Figure 4. There is a trend of improving online course completion rates at the California Community Colleges<sup>12</sup>



This effort also comes at a time as a large share of the American population, including key parts of the college's target population, demonstrate gains in Internet adoption and home broadband use. As of 2016, 81 percent of high school-educated adults use the Internet, and that rises to 94 percent for those with some college.<sup>13</sup> According to a Public Utilities Commission 2016 annual report, approximately 95 percent of California households have wired broadband services available to them, though this does not reflect actual utilization of home broadband.<sup>14</sup> Survey data from the Pew Charitable Trusts reveal that more Americans have become smartphone-enabled over time, which opens up new ways to reach and deliver services. Moreover, Americans with less than a bachelor's degree and low-income Americans are more likely to rely on smartphones for Internet access, and these phones may enable Internet access to computers through hotspot technology.<sup>15</sup> Additionally, according to a 2012 Digital Diaspora report, data from Pennsylvania about recent immigrants show unprecedented technical fluency and comfort with technology and that these attitudes and patterns of usage held steady across an extraordinary diversity of ethnic, linguistic, educational, and socioeconomic backgrounds.<sup>16</sup>

### Existing Online Education Efforts

Efforts to build a new fully online college complement existing efforts in California. California Community Colleges (CCCs) currently provide a wide array of online education offerings. Many of the 114 community colleges provide over 13,000 online courses available to students,<sup>17</sup> and roughly 800,000 students enrolled in online courses in 2015-16.<sup>18</sup> In addition, the Governor and the CCCs have piloted multiple programs through the Online Education Initiative over the past five years aimed at expanding the ability of individual CCCs to have greater capacity to support online course and professional development. These programs include:

1. **Online Education Initiative.** The Online Education Initiative has been a collaborative effort to build out the social and technological infrastructure for online education at the individual community college-level. They have provided common infrastructure at no or low-cost for all CCCs, which has included system-wide resources (such as a common course management system, system infrastructure, training for the adoption of a common course management system, online proctoring, plagiarism detection, course design standards, and help desk support) and centralized support services for students (such as online tutoring, counseling, and help desk support).

The Online Education Initiative has worked to knock down barriers for enrollment across CCCs through its Course Exchange pilot. The Course Exchange's goal is to provide a seamless path for students to register for online courses across colleges without requiring separate application, financial aid, and matriculation processes.

The Online Education Initiative supports groups of teaching faculty with the training and tools needed to develop online courses, including a peer-supported instructional network that provides feedback to individual instructors, enhancing professional development opportunities for faculty with little or no formal pedagogy or training in online delivery. This learning network presents a powerful opportunity for faculty on campus to build or improve their online teaching capacity and add to the inventory of online courses available to CCC students.

The Online Education Initiative has been critical in providing all local campuses with the means and incentives to engage with teaching and student support practices offered through an online platform, but each college has been varied in its engagement with and adoption of the Online Education Initiative resources. For example, though most of the 114 colleges have adopted the common course management system, only 68 colleges have adopted the 24x7 online tutoring, 58 colleges have adopted the online counseling platform, and only 17 colleges use the online plagiarism detection tool.<sup>19</sup> Only six colleges are participating in the Course Exchange pilot, and there are currently only about forty course sections available through the pilot.<sup>20</sup> Much remains to be done for the Online Education Initiative to achieve scale in its ability to offer completely online Associate Degrees for Transfer programs or remove the impediment to students by offering access to bottleneck “gateway” courses important to transfer.

2. California Virtual College. The California Virtual College is a complete catalog of online courses offered by postsecondary schools in California. Students can filter courses by segment (CCC, UC, CSU, independent), can choose Associate Degree for Transfer courses, and can search for specific classes by zip code. However, a student cannot register for a course on the California Virtual College website, and little information is available to distinguish course quality and outcomes.
3. Zero-Textbook-Cost Degrees and Open Educational Resources (OER). The Zero-Textbook-Cost Degrees program’s goal is to reduce the cost of education for students by developing, implementing, and sustaining Zero-Textbook-Cost Degree pathways. Each of the courses in these pathways will have alternative instructional materials and methodology that are at zero cost. This can include OER materials, which are high-quality teaching, learning, and research resources that are in the public domain. Currently, the Zero-Textbook-Cost Degrees program is in the planning stages, but the first five Zero-Textbook-Cost Degree programs will begin in 2018, and another twenty are slated to begin in 2019.

## Features of Online Education Proposal

To increase access to postsecondary education for up to 2.5 million Californians, the Department of Finance, in consultation with the California Community Colleges Chancellor’s Office, proposes the creation of an independent, local online community college that would be under the jurisdiction of a newly established, independent district under the Chancellor’s Office. The college would be required to seek accreditation and meet requirements for students to become eligible for federal financial aid and state financial aid.

The college would be developed and guided by principles and procedures established by the Chancellor’s Office. These guiding principles should include:

- Offering working adults additional access to higher education opportunities with **labor market value**.
- Providing working adults with **flexible course scheduling and start times**.
- Supporting student success by developing and implementing **innovative teaching and student support** methodologies and technologies.
- Enhancing system-wide student success efforts by using the college’s innovative teaching and student support methodologies and technologies to inform **professional development opportunities** available to the rest of the system.

- Aligning the college's efforts with the broader goals outlined in the System's *Vision for Success* and holding the college **accountable for its students' outcomes**.

The mission of the online college would be to create an organized system of accessible, high-quality online content, courses, and programs focused on providing credible certification and credentials compatible with vocational and educational needs for Californians who are not currently accessing higher education. Content, courses, and programs developed by the college could provide support for careers in growing industries, including advanced manufacturing, healthcare, the service sector, in-home support services, and child development, among other areas. While any California resident would be able to attend the college, the college's targeted demographic would be on adults who do not yet have a postsecondary credential and whose schedules do not fit into traditional, classroom-based settings. The goal of the online college is not to compete for students who are receiving an in-person education, but to provide further access to a high-quality and affordable alternative for students who are unable to access or obtain an education in a traditional setting.

The college will hire faculty, student support service experts, and other staff to support the unique and diverse needs of students accessing the college's programs and to ensure student success in the current and future workforce. Initially, the college will meet and confer with representatives of its employees, and as the college becomes more established, it will transition to collective bargaining with representatives of its employees.

Leveraging the momentum of the Strong Workforce Program, it is vital for the college to work closely with other agencies, industry partners, and experts to ensure the success of the college. This includes collaboration with other entities, such as the California Labor and Workforce Development Agency and the California Department of Corrections and Rehabilitation, to incorporate strategies to provide immigrants and formerly incarcerated Californians with educational opportunities. The college will also work through elements identified by Connecting Credentials as needed to support working adult students. These elements include, but are not limited to, financial aid, dealing with working learners' prior educational debts that may impede release of transcripts and credits, pathway navigational help, contextualized academic preparation, navigation of family needs and other supports, and coaching/mentoring. The online college should help provide clarity for the targeted group of students to easily access the college's content, courses, and programs, and as a result, the college will collaborate with community-based organizations to identify strategies to apprise the underserved learners of the opportunity to enroll in the online college. Furthermore, as the online college builds out its infrastructure, it should keep in mind its capacity for expansion and consider that the UC and CSU systems may wish to partner with the college to integrate or create their own programs in the future.

The key activities of the proposed online college would include:

1. **Expanding working adults' access to higher education.** The college will offer at least three program pathways in the first three years of program implementation that is developed exclusively to serve the population of students not yet accessing postsecondary education or without their first industry-valued industry credential. The college will plan to enroll students by the last quarter of 2019.
2. **Focusing on student outcomes with the creation of new content and technology.** The college's initial priority of activities include:
  - a. Creating new online programs that are aligned with industry needs and have labor market relevance.
  - b. Establishing competency-based educational opportunities that recognize a student's prior learning and help a student advance toward a credential.
  - c. Supplementing the Registered Apprenticeship program and the California Apprenticeship Initiative training, and creating journey-worker upskilling valued by the labor and employer communities.
  - d. Identifying opportunities for short-term, stackable credentials, and industry certifications with labor market value.

- e. Developing or adapting technology that is mobile-friendly.
  - f. Developing a Research and Development Unit that is focused on leveraging current and future learning sciences technology, that assesses data metrics within the technological infrastructure to gauge student progress in a course or pathway, informs instructional and support strategies, and improves on the functionality of the underlying technology.
  - g. Re-designing transcripts to link certificates, courses, and competencies while providing them in a digital, verifiable format to students.
  - h. Identifying shortcomings in the student experience for unserved and underserved students and develop technological and programmatic solutions to address the gap.
  - i. Distributing gains in data and learning science and effective technology-enabled tools and resources throughout the California Community Colleges.
3. **Focusing on student outcomes and reducing student costs by aligning with the broader goals outlined in the System's *Vision for Success*.** To avoid duplicating existing programs offered by community colleges, the online college will be informed by, aligned with, and leverage the programs and activities of the Chancellor's Office, including the Online Education Initiative and Integrated Technology portfolio, the Zero-Textbook-Cost Degrees program and Open Educational Resources, and the Guided Pathways Model framework. This will include the following activities and practices:
- a. Organize newly developed content into programs under the Guided Pathways Model framework.
  - b. Building on the existing social and technological infrastructure for students, instructors, and administrators.
  - c. Enhancing system-wide student success efforts by using the college's innovative teaching and student support methodologies and technologies to inform professional development opportunities available to the rest of the system through the Online Education Initiative and/or Institutional Effectiveness Partnership Initiative.

Funding for the local, online college would be supported by Proposition 98 funds, with \$20 million in ongoing funds and \$100 million in one-time funds that would be available over a seven-year period. Ongoing funds will support the ongoing operations, such as licensing and maintenance of technology, professional development and training, the continuous assessment of student program pathways, and salaries paid to college staff. One-time funding would support start-up costs including, but not limited to: roadmap development and capital investment costs for scalable technology infrastructure development to support the instruction, 24x7 technology support, continuous improvement modeling, and administrative functions; the design and development of a Research and Development Unit which may include fully-supported virtual and mobile labs in order to assess learning science, establishment of key partnerships with entities with a physical presence (e.g., libraries, community college labs and facilities), and demonstration pilots to test and refine technology and program development to ensure greater effectiveness and scalability; support for the development of core functions such as mapping the student experience, developing and testing a new fee model, establishing a student outreach plan, and establishing key employer partners; development of seven-year business plan with key milestones, indicators, and outcomes; establishing business processes, accreditation planning, legal support, development of initial and long-term staffing plan, personnel policies and procedures, establishment of responsive metrics and indicators driving student success to inform design; and scaling efforts over the seven-year start-up period. Costs for the Chancellor's Office to provide guidance and direction to the college will be supported by the General Fund.

In addition, consistent with the Governor's Budget proposal for a Student-Focused Funding Formula, apportionment funding for the online college would take into account student enrollment and the number of underrepresented students enrolled in the college, as well as incentivizing the online college to focus on student success. The college will not impact traditional community colleges' enrollment because its enrollment base will be working adults who are not currently accessing higher education.

To facilitate program stackability into credit-bearing courses that can expand students' opportunities for future learning and successive wage gains, the college would be expected to leverage and develop articulation agreements or develop new ones with other California Community Colleges, the California State University, the University of California, and other accredited public and independent institutions where applicable to articulate coherent and complete pathways for students. For example, this entity could collaborate with regional consortiums to create degree programs that are industry-driven and relevant to regional needs.

There could be system-wide efficiencies gained through the online college, such as enhanced utilization of resources for creating online course content and enhanced professional development opportunities. However, it is important to note that not every aspect of this system can achieve economies of scale. In addition to online student support services, the online college could collaborate with other community colleges, other education providers, community-based organizations, employers, unions, and libraries, to enable students of the online college to access in-person support services at other physical locations as needed, including use of a library, computer lab, other labs, and tutoring services.

The online college could continue with the current fee-per-unit model, but it would also have the flexibility to offer an experimental, subscription-based flat rate for a set time period (or academic term). Under such a model, students could take as many courses as desired during that period. Regardless of the college's fee structure, students would be eligible for fee waivers that mimic the California College Promise Grants and College Promise fee waivers available pursuant Chapter 735, Statutes of 2017 (AB 19). The online college will also consider developing a revenue sharing model to allow any increases in revenues over costs to help accelerate the adoption of new learning technologies for the benefit of all CCC campuses.

Here is additional detail on key activities expected to be performed by the online college:

1. ***Establishing competency-based education components.*** According to the U.S. Department of Education, "transitioning away from seat time, in favor of a structure that creates flexibility, (competency-based learning) allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning. Competency-based strategies provide flexibility in the way that credit can be earned or awarded, and provide students with personalized learning opportunities... This type of learning leads to better student engagement because the content is relevant to each student and tailored to their unique needs. It also leads to better student outcomes because the pace of learning is customized to each student." Competency-based education incorporates the knowledge and skills students acquired at a prior time of their lives. Examples of prior learning include prior military service, workplace training including apprenticeships, and approved certificates.

Competencies are developed by appropriate faculty and employers and are focused on knowledge and skills that a student must demonstrate to pass a course and to ultimately earn a credential. Once identified, content, courses, and assessments are then mapped to these competencies. Students who are able to learn by demonstrating mastery of skills will receive credit to advance toward a credential. For students who are older and already have experience, this practice can be useful for more quickly attaining credits.

2. ***Identifying opportunities for short-term, stackable badges and industry certifications valued for employability.*** As students make their way through a program pathway, they are learning valuable skills and gaining a knowledge base. Enabling students to earn badges and industry certifications as they move along a pathway can provide a short-term resume boost for a student, as well as indicate to the student and employers the skills and competencies that have been acquired through coursework. For students who are already working, they may see incremental benefits from a certification, such as a pay raise or promotional opportunity. While these benefits may not have the same demonstrable effect as an associate's or baccalaureate degree, they still have a significant and more immediate impact for a working student that is critical for maintaining motivation.

Ultimately, these badges and certifications should be stackable toward a degree.

3. ***Developing or adapting technology that is mobile-friendly.*** While a growing number of Californians have gained access to the Internet over time, there is variation in how much of that usage is on computers versus tablets or mobile phones. There are some students who would benefit from a technological platform that is mobile friendly. In addition to increased ease in checking for assignments and reviewing messages from instructors or administrators, a mobile-friendly platform might make it easier for students to consume some of their education or student supports while on-the-go. For example, students could watch short lessons on their lunch break from work or any other times have available in their busy lives. Alternatively, a student could listen to an audio version of a tutoring session to learn a concept while running errands or while their children nap—a space that podcasts currently fill for many people. While mobile technology may not be ideal or even appropriate for certain assignments, there is still significant value to recognizing it as a tool for consuming information, especially for students who may not have readily access to a computer with an Internet connection or cannot physically get to a campus.
4. ***Building a Research and Development Unit, that is focused on integrating data metrics into the technological platforms and reviewing the data to ensure pilot models and technologies used by the college are effective.*** An objective of the online college should be creating a culture of continuous quality improvement for faculty, staff, and administrators that is student-centered and focused on the science of learning to ensure that the technology used by the college is working for the communities it is intended to serve. This could be called the Research and Development Unit. The unit could focus on building in data metrics that measure student progress throughout a course or pathway, trigger faculty or tutor interventions, and assess the user friendliness or accessibility of the technology. It could monitor and review data, and results that would be shared with faculty, staff, administrators, and content developers to inform continual improvement. The Unit can also monitor the learning and teaching outcomes that emerge from an experimental, subscription-based funding model, which de-links students and teachers from the week-to-week schedule of an academic term. The Unit can be a separate research and data analytics team within the online college, or its objectives can be built into the responsibilities of other staff.

A Research and Development Unit could also build out artificial intelligence-based student support services. One example is at Georgia Tech, which has an online master's program for computer science. They have a concept that is analogous to a "Smart FAQ" which uses machine learning to catalog questions asked by students and provide answers for the questions that are most frequently asked. The Unit can establish demonstration projects through simulations conducted through virtual and mobile labs.

5. ***Re-designing transcripts to link certificates, courses, and competencies, and providing them in a digital, verifiable format that students can quickly access.*** With an increased focus on certificates and competencies, transcripts should be re-designed to include this information, along with coursework. This will keep track of a student's entire body of learning in one place and will more easily demonstrate to employers the multiple ways that learning has occurred. With a more decentralized network of classes through the online college, it will be vital to seamlessly produce transcripts with courses and certificates that cut across colleges and/or segments. Any barriers to that should be identified and addressed.

In addition, digital transcripts that are verifiable, tamper-proof, and easily accessible are on the rise. The Massachusetts Institute of Technology has developed an open-source toolkit called Blockcerts, which any developer or school can use to issue and verify blockchain-based educational credentials.<sup>21</sup> These digital transcripts would give greater agency to students, allowing them to quickly share their



information with employers and schools, and may reduce or eliminate some of the cost for students of accessing transcripts.

6. ***Building on existing social and technological infrastructure for students, instructors, and administrators.*** This includes building up the common course management system platform for online classes and course content; including the new online program pathways as part of the California Virtual Campus; investing in free, online educational materials (including basic skills resources) through the Open Educational Resources and Zero-Textbook-Cost Degrees; building out student support services—such as online tutoring, counseling, help desk support, easy communication channels between students and faculty—that are focused on the student experience; and fleshing out other foundational features of an online experience (proctoring, student authentication, plagiarism detection). In addition to online student support services, the college could collaborate with other educational entities to expand students' access to in-person student services, including use of the library, computer lab, and tutoring.
7. ***Informing professional development and training opportunities for faculty to develop and improve high-quality course content through the specific lens of online education.*** Faculty should be supported in the development of content with regard to the pedagogical, social, and technological aspects of an online course; the Online Education Initiative currently offers a 4-week training course for colleges adopting common course management system. The online college can share its methods, learning, insights with the existing Online Education Initiative and professional development and training opportunities available through the Institutional Effectiveness Partnership Initiative.

## **Online College Implementation Schedule**

In year 1-2 of implementation, the online college is expected to, at a minimum, meet the following milestones:

1. Fully develop an implementation plan, validate a business plan, and develop three program pathways designed in partnership with employers and industry groups.
2. Hire the start-up core team within the College.
3. Establish the Board of Governors of the California Community Colleges as the college's initial governing board. The governing board can designate members with the appropriate skills and experience, including those necessary to guide the formation of a new entity to act on its behalf.
4. Formally establish the entity, develop internal business processes and personnel policies, and establish outcomes goals.
5. Map out the student experience process including, but not limited to: recruiting, onboarding, transcriptions, instructional experience, billing, entry into an internship (if applicable), and entry into a job (if applicable).
6. Develop an accreditation plan.
7. Create a statewide outreach plan, which includes working with immigrant groups and community-based organizations to reach the target population of underserved working learners and help design solutions that work for these learners.
8. Define the duties for instructional support, program development, and other student experience activities.
9. Partner with an existing national provider of prior learning assessment to establish business processes that simplify recognition of prior learnings into the student onboarding experience.

In year 2-3 of implementation, the online college is expected to, at a minimum, meet the following milestones:

1. Enroll students into the college's program pathways. The college will plan to enroll students by the last quarter of 2019.
2. Incorporate student feedback to improve the college's instruction, technology, and student support services.
3. Design and validate at least three more program pathways, including coordinating the creation of new content.

4. Apply for accreditation from U.S. Department of Education recognized accreditor.

In year 3-4 of implementation, the online college is expected to, at a minimum, meet the following milestones:

1. Enroll students into the program pathways.
2. Incorporate student feedback into improvement of instruction, technology, and support services.
3. Design and validate at least five more program pathways, including coordinating the creation of new content.

In year 4-5 of implementation, the online college is expected to, at a minimum, meet the following milestones:

1. Enroll students into the program pathways.
2. Incorporate student feedback into improvement of instruction, curriculum, technology, and support services.
3. Design and validate at least five more program pathways, including coordinating the creation of new content.

In year 6-7 of implementation, the online college is expected to, at a minimum, meet the following milestones:

1. Enroll students into the program pathways.
2. Incorporate student feedback into improvement of instruction, curriculum, technology, and support services.
3. Prepare for scaling.

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<sup>1</sup> “B15001: SEX BY AGE BY EDUCATIONAL ATTAINMENT FOR THE POPULATION 18 YEARS AND OVER - Universe: Population 18 years and over, 2011-2015 American Community Survey,” U.S. Census Bureau, <https://www.census.gov>.

<sup>2</sup> “Report on Options for an Online, Statewide Community College”, The National Center for Higher Education Management Systems, November 2017, <http://doingwhatmatters.cccco.edu/portals/6/docs/FLOW/FLOW%20Options%20Report%20112917.3.pdf>.

<sup>3</sup> “2011-15 American Community Survey Five-Year Public Use Microdata Sample”, U.S. Census Bureau, <https://www.census.gov>.

<sup>4</sup> “2011-15 American Community Survey Five-Year Public Use Microdata Sample”, U.S. Census Bureau, <https://www.census.gov>.

<sup>5</sup> The University of Phoenix and Southern New Hampshire University charge \$410 per unit ([http://www.phoenix.edu/tuition\\_and\\_financial\\_options/financial-plan-services/tell-us-about-yourself](http://www.phoenix.edu/tuition_and_financial_options/financial-plan-services/tell-us-about-yourself)) and \$320 per unit (<https://www.snhu.edu/tuition-and-financial-aid/tuition-and-fees/online-and-regional-center-tuition-and-fees>), respectively, while the California Community Colleges—for those earning enough to pay—charge \$46 per unit.

<sup>6</sup> Fall 2015 data from Integrated Postsecondary Education Data System, National Center for Education Statistics, <https://nces.ed.gov/ipeds/Home/UseTheData>.

<sup>7</sup> “2005-2016 American Community Survey Public Use Microdata Sample”, U.S. Census Bureau, <https://www.census.gov>.

<sup>8</sup> Hilary Wething, “Job Growth in the Great Recession Has Not Been Equal Between Men and Women,” Economic Policy Institute, August 26, 2014, <http://www.epi.org/blog/job-growth-great-recession-equal-men-women>.

<sup>9</sup> Anthony P. Carnevale, Jeff Strohl, and Neil Ridley, “Good Jobs That Pay Without A BA: A State-By-State Analysis,” Georgetown University Center on Education and the Workforce, 2017, <https://goodjobsdata.org/wp-content/uploads/Good-Jobs-wo-BA.pdf>.

<sup>10</sup> “The Digital Edge: Middle-Skill Workers and Careers,” Burning Glass Technologies, September 2017, [http://burning-glass.com/wp-content/uploads/Digital\\_Edge\\_report\\_2017\\_final.pdf](http://burning-glass.com/wp-content/uploads/Digital_Edge_report_2017_final.pdf).

<sup>11</sup> “2005-2016 American Community Survey Public Use Microdata Sample”, U.S. Census Bureau, <https://www.census.gov>.

<sup>12</sup> “Credit Course Retention/Success Rate Summary Report”, California Community Colleges Chancellor’s Office MIS Data Mart, <http://datamart.cccco.edu/>.

<sup>13</sup> “Internet/Broadband Fact Sheet”. Pew Charitable Trusts, January 12, 2017, <http://www.pewinternet.org/fact-sheet/internet-broadband/>.

<sup>14</sup> “Department of Finance Bill Analysis – AB 1665”, California Department of Finance, September 5, 2017, [http://www.dof.ca.gov/legislative\\_analyses/LIS\\_PDF/17/AB-1665-20170905105640AM-AB01665.pdf](http://www.dof.ca.gov/legislative_analyses/LIS_PDF/17/AB-1665-20170905105640AM-AB01665.pdf).

<sup>15</sup> “Internet/Broadband Fact Sheet”. Pew Charitable Trusts, January 12, 2017, <http://www.pewinternet.org/fact-sheet/internet-broadband/>.

<sup>16</sup> “Digital Diaspora: How Immigrants Are Capitalizing on Today’s Technology”, Welcoming Center for New Pennsylvanians, November 2012, [http://www.immigrationresearch-info.org/system/files/Welcoming\\_Center\\_-\\_digital\\_diaspora.pdf](http://www.immigrationresearch-info.org/system/files/Welcoming_Center_-_digital_diaspora.pdf).

<sup>17</sup> California Virtual Campus as of December 2017, <https://www.cvc.edu>.

<sup>18</sup> Presentation from California Community Colleges Board of Governors meeting, November 13, 2017, <http://www.3emediasolutions.org/services/CCC-Board-of-Governors/archive/November2017>.

<sup>19</sup> Michael Feldstein, Phil Hill, Kevin Kelly, “The OEI: Improving quality, student success and lowering costs through statewide collaboration,” MindWires, LLC, October 19, 2017.

[http://extranet.cccco.edu/Portals/1/ExecutiveOffice/Board/2017\\_agendas/November/4.1-Attachment-OEI-Update.pdf](http://extranet.cccco.edu/Portals/1/ExecutiveOffice/Board/2017_agendas/November/4.1-Attachment-OEI-Update.pdf)

<sup>20</sup> “Courses in the Course Exchange”. California Community Colleges Online Education Initiative, January 9, 2018, <http://ccconlineed.org/courses-in-the-course-exchange/>.

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<sup>21</sup> Elizabeth Durant, Alison Trachy, "Digital Diploma debuts at MIT," MIT News, October 17, 2017, <http://news.mit.edu/2017/mit-debuts-secure-digital-diploma-using-bitcoin-blockchain-technology-1017>.