Report on Options for an Online, Statewide Community College

For the
California Community Colleges Chancellors Office

By The National Center for Higher Education Management Systems with assistance from the FLOW workgroup

November 2017

NCHEMS

Table of Contents

Report on Options for an Online, Statewide Community College 2
Information Analysis and Conclusions 6
Technological Realities for Target Populations 16
Supporting Working Adults in Online Education 18
Other Sources of Information 19
Considerations for Design 21
Options for FLOW 24
Cost Considerations for Flow Model Options 33
How FLOW Model Can Work for Students 37
Appendix A. Working Group Biographies 42
Appendix B. Existing Programs Presentations 49
Appendix C. Cost Estimates Detail 50
Appendix D. Revenue Scenarios 51
Appendix E. Summary of Public Comments on FLOW Options 52
Appendix F. White Papers 53

Report on Options for an Online, Statewide Community College

In the spring of 2017, Governor Jerry Brown asked California Community Colleges (CCC) Chancellor Eloy Ortiz Oakley to provide him with options for how to establish a community college that exclusively offers fully online programs to make college more accessible and affordable to unserved Californians.

Since then, the Board of Governors has adopted Vision for Success, a document which calls for the community college system to better serve working adults in order to meet California's workforce needs of the future.

In order to address these challenges, Chancellor Oakley convened a workgroup to assist in the development of a plan to provide three to five options that enable the community colleges of California to better deliver on student success goals, including through online opportunities. The workgroup is co-chaired by CCC Vice Chancellor for Workforce and Digital Futures Van Ton-Quinlivan and Cerritos College President Jose Fierro and has representation from the Academic Senate (ASCCC) and other system constituencies, as well as the Governor's office.

This endeavor is called "Flex Learning Options for Workers", or FLOW. Consistent with *Vision for Success*, Chancellor Oakley defined the target population for the proposed options as "adults with some college and no certification" as well as "working adults with vocational needs" to enable them to earn certifications that lead to better workforce outcomes.

In order to meet the November 2017 deadline established by the Governor, the National Center for Higher Education Management Systems (NCHEMS) was engaged to work with the system stakeholders and online thought leaders to develop these options. The Kresge Foundation is providing funds to underwrite NCHEMS's participation thanks to the outreach of the Foundation for California Community Colleges and the Success Center.

The general public had opportunities to provide feedback via this linked form hosted at the Chancellor's office. The collection of those comments can be found in Appendix E.

The scope of work for NCHEMS with the assistance of the workgroup includes the following:

- Identify those whom the California Community Colleges are not currently serving well through traditional education delivery models.
- Identify online education models that will reach these students and best facilitate their completion of useful credentials.
- Determine how the California context factors into the creation of possible options, including existing models.
- Identify three to five options along with pros, cons, and associated challenges.

NCHEMS coordinated the ideation process of the workgroup. The role of the workgroup was to provide NCHEMS with information and insights from their diverse perspectives, but it was not to reach any kind of consensus. All of the data in this report and all of the draft versions of the options were discussed in the workgroup and workgroup members worked together in good faith to provide guidance. The discussions were quite lively and very useful in understanding the variety of perspectives among the members ranging from business models, how to scale operations, sustainability, state regulations, pedagogic considerations, support for students from different

populations, employer partnerships, and specific proposals for models that might suit the requirements. The members of the workgroup included (see Appendix A for biographies):

Name	Organization
Van Ton-Quinlivan	California Community Colleges Chancellor's Office
Jose Fierro	Cerritos College
Cheryl Aschenbach	ASCCC / Lassen College
Anthony Culpepper	Glendale Community College District
Chris Ferguson	California Department of Finance
Sandra L. Fried	Success Center, Foundation for Community Colleges
Jory Hadsell	CCC Online Education Initiative
Judy Heiman	Legislative Analyst's Office
Jennifer Hernandez	Farmworker & Immigrant Services
Paul Jarrell	Santa Barbara City College (participated in early sessions)
Raymond Kaupp	Foothill College
Ross Miyashiro	El Camino College
Joseph Moreau	Foothill-De Anza Community College District
Lissette Y. Padilla	West Hills Community College District
Michelle Pilati	Rio Hondo College and ASCCC
Meridith Randall	Chaffey College (participated in later sessions replacing Paul Jarrell)
Vince Rodriguez	Coastline Community College
Karen Surratt	Student and Proprietor of Karen's Heritage Day Care
Treva Thomas	Lake Tahoe Community College
Carlos O. Turner Cortez	San Diego Continuing Education

In addition, there were several invited observers that attended the workgroup meetings. They included:

August 28-29 Meeting	
Louis Delzompo	California Community Colleges Technology Center , Chief Technology Officer
Paul Feist	California Community Colleges Chancellor's Office, Vice Chancellor of Communications
Russell Grant	California Community Colleges Chancellor's Office, System Software Specialist III
Laura Hope	California Community Colleges Chancellor's Office, Executive Vice Chancellor for Educational Services
Ann Volk	Alvarez & Marsal, Director of Business Consulting, Performance Improvement
LeBaron Woodyard	California Community Colleges Chancellor's Office, Dean of Academic Affairs

October 30 meeting	
Lande Ajose	California Competes, Executive Director
Edgar Cabral	Legislative Analyst's Office, Principal Fiscal & Policy Analyst

This workgroup reviewed the major online projects that already exist among the community colleges, other California initiatives, and out-of-state initiatives that serve large numbers of students online. The presentations by these groups can be seen in Appendix B.

In addition to the workgroup of Californians, Jay Box, President of the Kentucky Community and Technical College Systems, Adrian Sannier, Senior Technology Fellow at Arizona State University Online, and Spencer Stewart, Chancellor, Western Governors University Nevada all provided on-going information and insights. NCHEMS also conducted individual interviews and/or more in depth discussions with the following individuals for their insights and experiences:

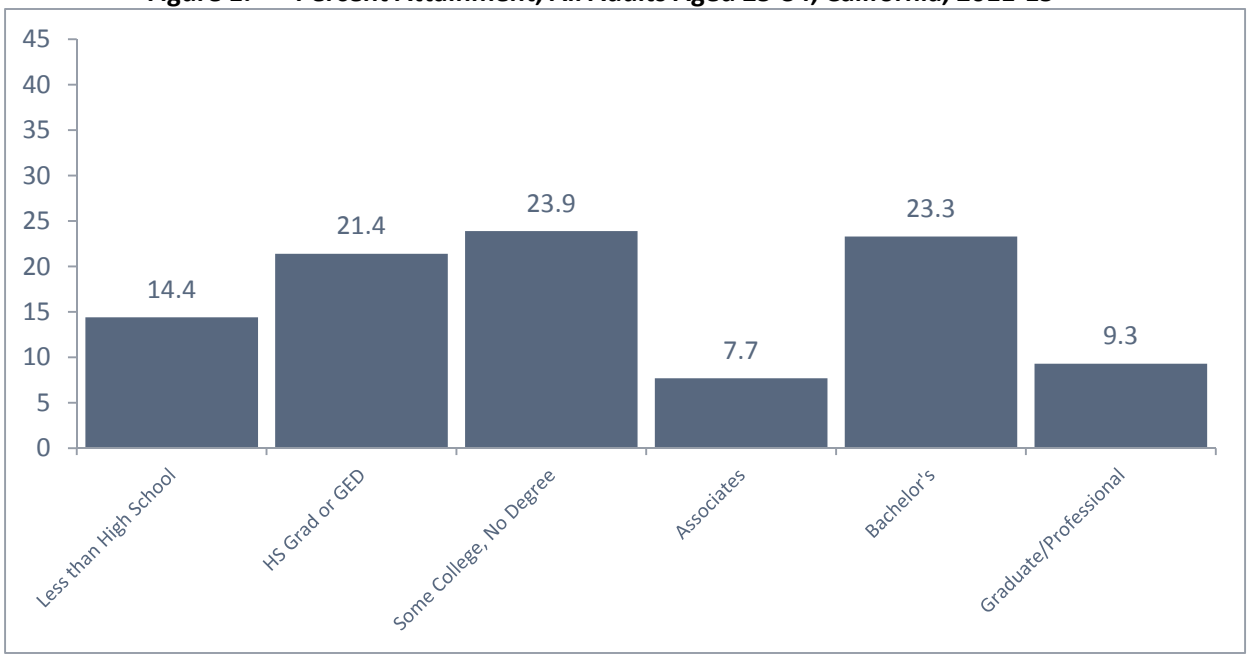
Name	Organization
Cheryl Aschenbach	North Representative (ASCCC) / English Professor (Lassen College) ASCCC /Lassen College
Amanda Bergson-Shilcock	Director of Upskilling Policy at the National Skills Coalition
Chris Cardona	Learning Objects Washington DC
Carlos O. Turner Cortez	President San Diego Continuing Education
Chris Ferguson	Principal Program Budget Analyst III California Department of Finance
Jose Fierro	President/Superintendent Cerritos College
Sandra L. Fried	Executive Director Success Center at the Foundation for Community Colleges
Jennifer Hernandez	Associate Secretary Farmworker & Immigrant Services Labor & Workforce Development Agency
Judy Heiman	Principal Analyst Legislative Analyst's Office
Patricia James	(Pat James Consulting) Served as Executive Director for the Online Education Initiative
Paul Jarrell	Chief Instructional Officer Santa Barbara City College
Dale P. Johnson	EdPlus @ ASU Arizona State University (adaptive learning specialist)
Robert T. Jones	Education & Workforce Policy Washington DC
Wes Jury	Chairman Texas Workforce Investment Council Office of the Governor
Ray Kaupp	Director of Workforce San Mateo Community College District
Brian King	Chancellor Los Rios Community College District
Steve Klingler	Education Services Salt Lake City UT

Leah Matthews	President Distance Education Accrediting Commission
Judy Miner	Chancellor Foothill-De Anza Community College District
Joe Moreau	Vice Chancellor of Technology & CTO CCC Online Education Initiative Executive Sponsor Foothill-De Anza Community College District
Michelle Pilati	Professor Psychology Rio Hondo College and ASCCC
Lee Richter	Chief Executive Officer Texas Workforce Investment Council Office of the Governor
Meredith Randell	Associate Superintendent Instruction & Institutional Effectiveness Chaffey College
Karen Surratt	Student and Sole-Proprietor of Karen's Heritage Day Care
Maritza Urquiza	Staff Finance Budget Analyst California Department of Finance Education Systems Unit
Alison Ascher Webber	Building Skills Partnership California
LeBaron Woodyard	Dean Educational Programs and Professional Development California Community Colleges Chancellor's Office
Richard Winn	President Accrediting Commission for Community and Junior Colleges (ACCJC)
Joe Wyse	Superintendent/President Shasta-Tehama-Trinity Joint Community College District
Michael Zastrocky	Executive Director The Leadership Board for CIO's in Higher Education

Information Analysis and Conclusions

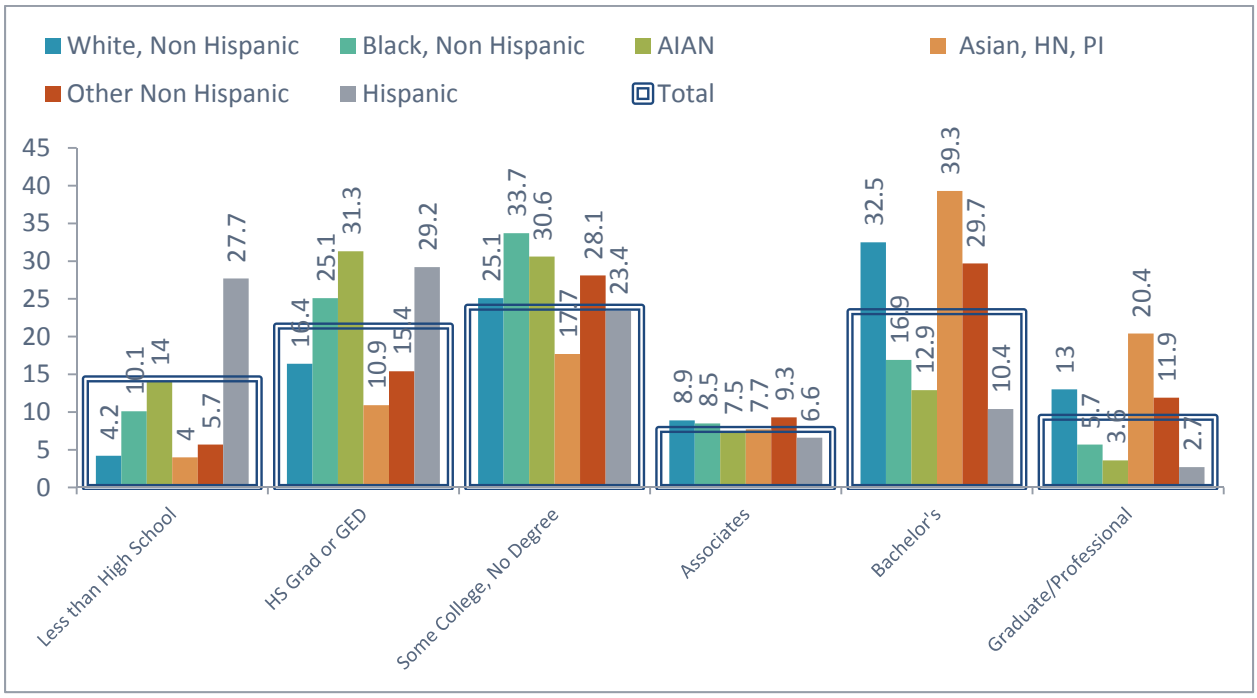
In order to validate and refine Chancellor Oakley's directives for the target population for FLOW, NCHEMS used available state and national databases to compile and analyze information regarding the audience for FLOW. As Figure 1 shows, about 45% of Californians have at least a secondary school credential or some college but no degree (over 40% do have degrees). Figure 2 breaks this group into standard ethnicity groups. The majority of individuals in these categories are Hispanic - almost 700,000 Hispanics have only a secondary school credential (see Figure 3) and 550,000 Hispanics have some college but no degree (see Figure 4).

Figure 1. Percent Attainment, All Adults Aged 25-34, California, 2011-15



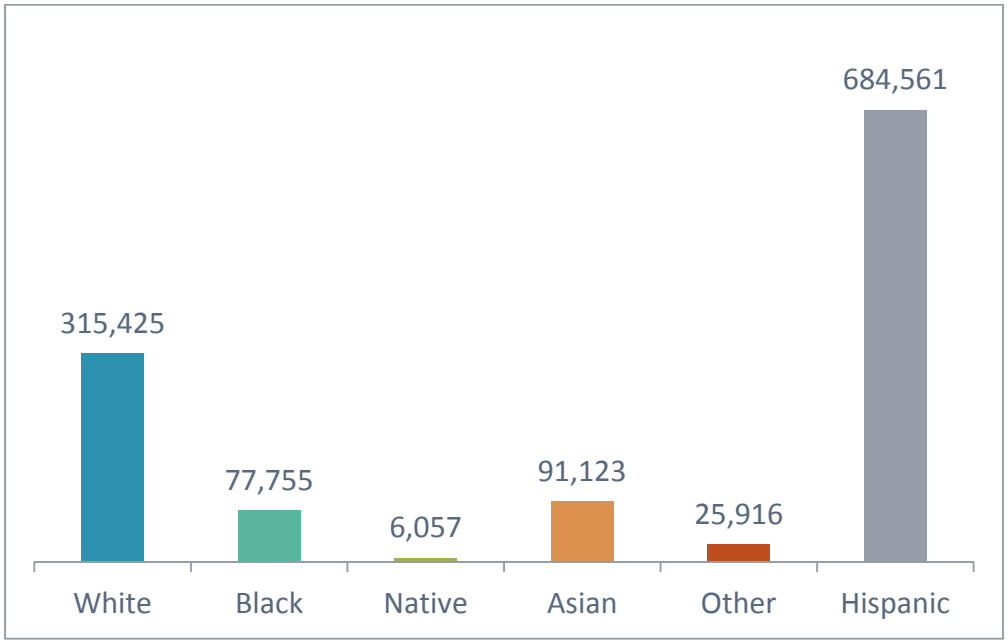
Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample.

Figure 2. Percent Attainment, Adults Aged 25-34, California by Race, 2011-15



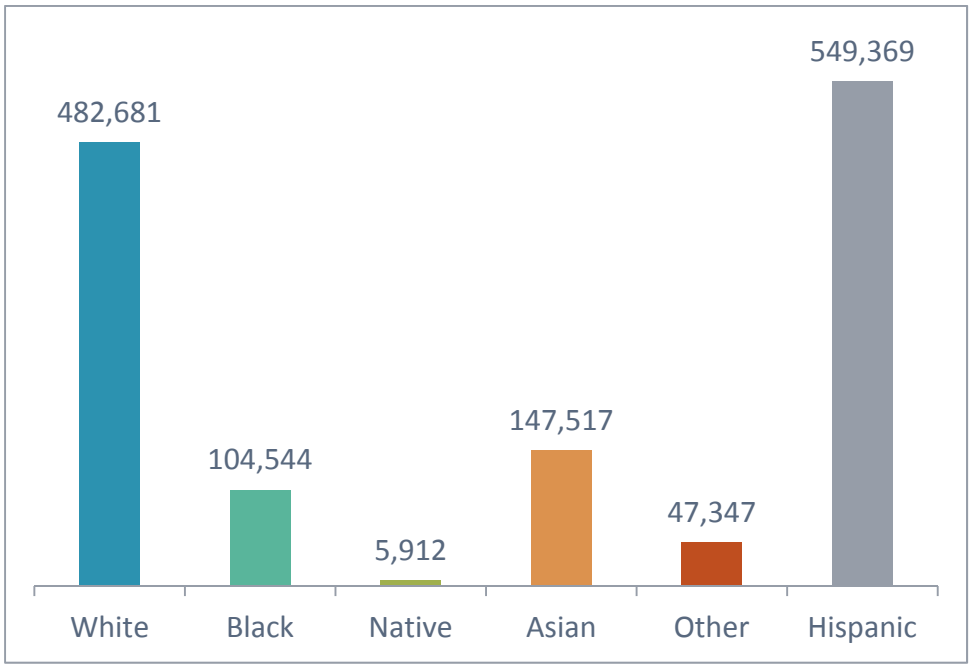
Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample.

Figure 3. Adults Aged 25-34 with High School or GED, California 2011-15



Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample.

Figure 4. Adults Aged 25-34 with Some College, No Degree, California 2011-15



Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample. If the target population is expanded to include individuals aged 25-64, the size of the potential audience grows to 8.75 million.

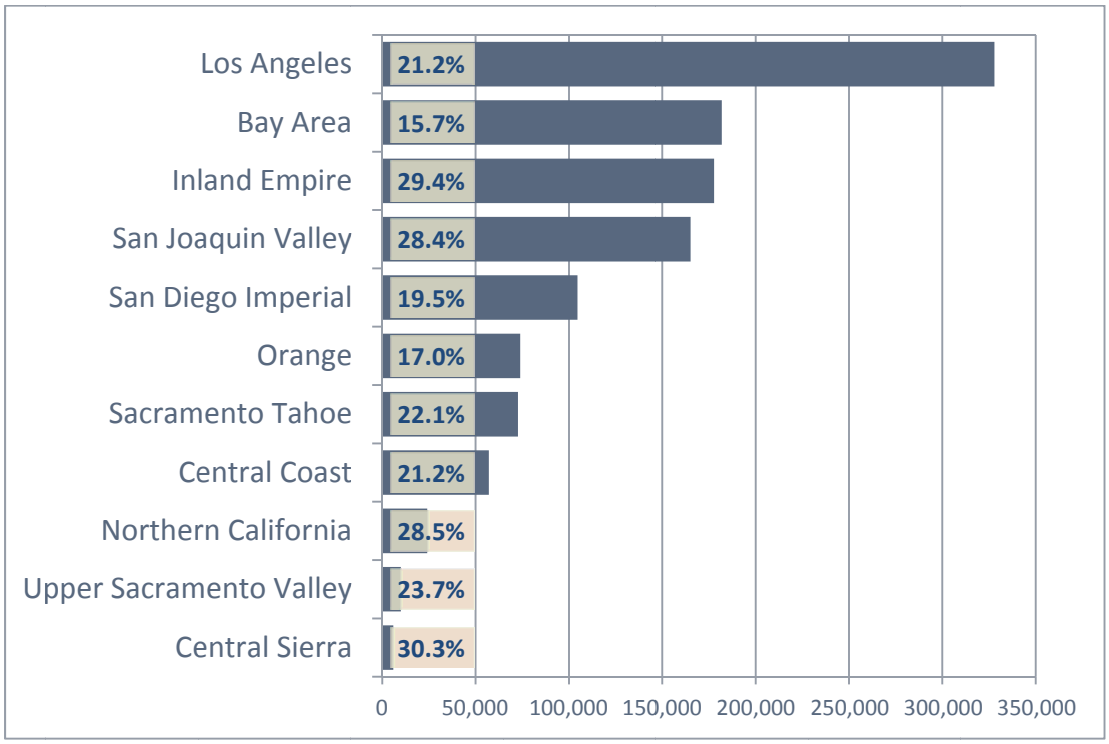
As all Californians are aware, different regions of the state are unique with regard to economies, populations, etc. and there is a need to stay aware of those differences. In order to get a clearer picture of who could benefit by FLOW services, NCHEMS analyzed data by region. Figure 5 indicates the economic regions of the state that were used in clusters of further analyses.

Figure 5. California Regional Map

Breaking out the educational attainment levels by region mirrors the population distribution of the state. From Figure 6, it is apparent that the Los Angeles (LA) region of California has the highest number of Californians aged 25-34 with educational attainment of only a high school credential at an estimated 327,892 individuals. Figure 6 also shows that 21% of the population in LA in that age group has only a high school credential. The Central Sierra region has the lowest number of Californians aged 25-34 with educational attainment of a high school credential only but it should be noted that an estimated 30.3% of 25-34 year olds in the Central Sierra region have only a high school credential. Thus while the numbers are much lower, the percentage in the Central Sierra is higher. The other regions of the state with percentages of 25-34 year olds with only a high school credential approaching 30% include the Inland Empire, San Joaquin Valley, and Northern California.

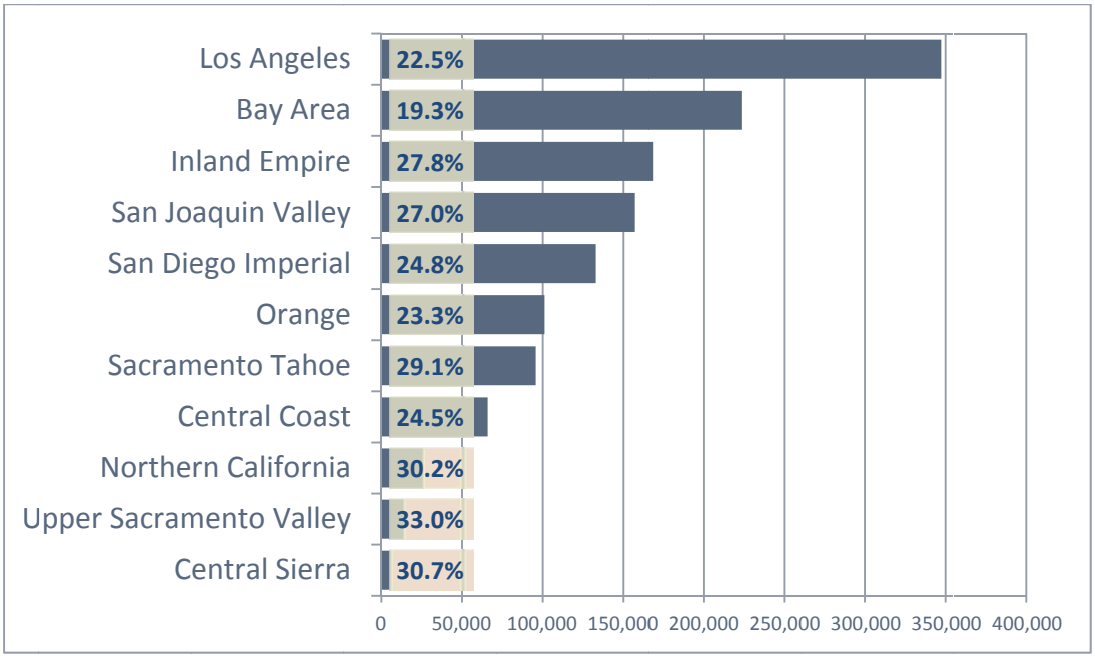
By breaking out the regions by numbers of Californians with some college but no degree (see Figure 7), there is a similar pattern based on the population distribution. The most important part of the analysis is that there are 2.5 million Californians between 25 and 34 years old with either just a high school credential or some college but no degree; of those, nearly half (48%) are Hispanic. This becomes the population that is most likely to benefit from a statewide online community college that focuses on working adults to open access. NCHEMS chose the ages of 25 to 34 because this is the population most likely to enroll. It is anticipated that a statewide, online community college designed to do a good job serving this younger adult population will also attract and be valuable for many adults aged 34 to 65 (a group consisting of 6.25 million individuals).

Figure 6. Number of Californians with High School Diploma or GED, Aged 25-34 by Region. Percentages of the population in each region are also included.



Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample.

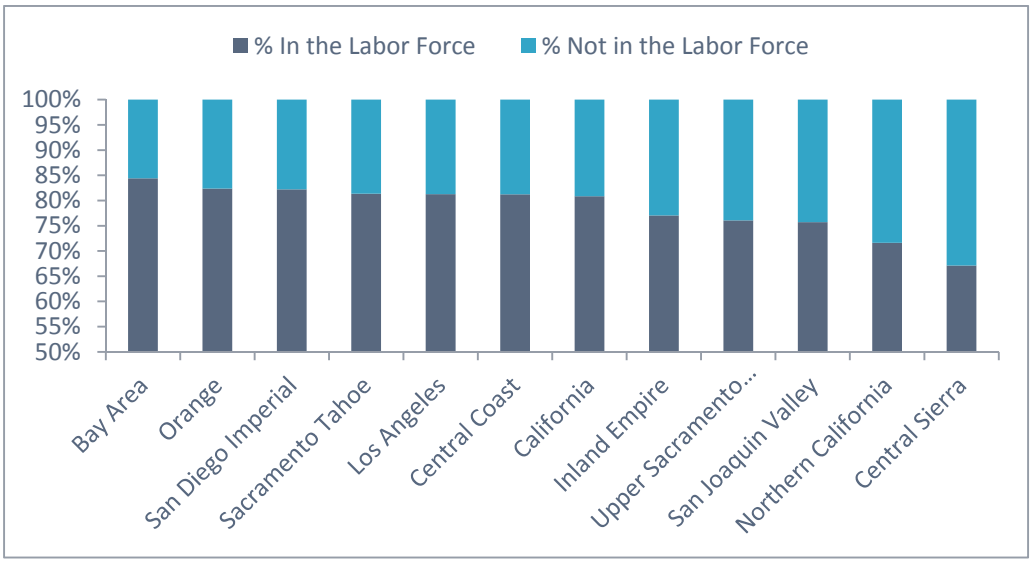
Figure 7. Number of Californians with Some College, No Degree, Aged 25-34 by Region. Percentages of the population in each region are also included.



Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample.

Over 80% of individuals in this target population are currently in the workforce. While the rate of work participation varies by regions, the percentage of working adults is highest in the most populous regions of the state (see Figure 8). The not-in-the-labor force label does not include those who are unemployed but seeking work.

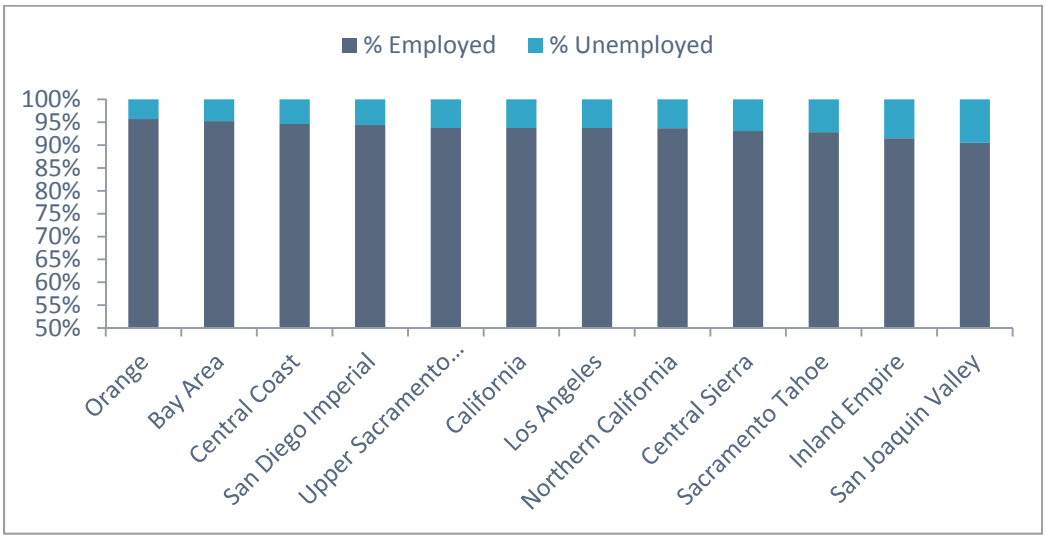
Figure 8. Labor Force Participation, Adults Aged 25-44, 2015



Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Public Use Microdata Sample.

The percentage of officially unemployed varies by the regions of the state (Figure 9). In the most populated areas, the percentage is 5% or less. In the less populated regions of the state that percentage climbs to close to 10%.

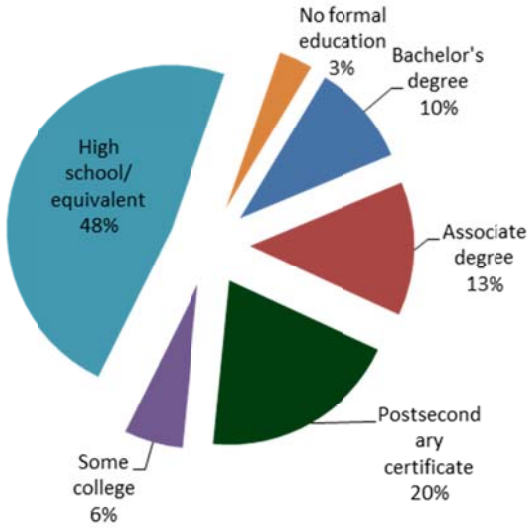
Figure 9. Employment Rates, Adults Aged 25-44, 2015



Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Public Use Microdata Sample.

Figure 10, taken from a report prepared in September 2017 by Centers of Excellence for Labor Marker Research for the Chancellor's Office on middle-skill occupations in California, shows the disaggregation by required educational levels. The report authors note that recognizing these required educational levels offers program planners insights into levels at which new educational and training programs are needed. They also note that most of these occupations require third-party certifications from industry or government licensure.

Figure 10. Middle-Skill Occupations by Education Level



Source: September 2017 report from the Centers of Excellence for Labor Market Research

Finally, Californians earning one to two year awards in 2015-16 were served by a variety of sectors. Figure 11 indicates that 26,963 Californians received these credentials from for-profit institutions (2-year and less than 2-year for-profits combined). California's public community colleges produced only 14,568 such awards. In other words, there is a demand for individuals holding these types of credentials but it is the for-profit institutions that currently meet most of the demand in California. This analysis does not tell us how many Californians attempted to earn these credentials but never completed them, yet likely incurred debt with which they are now burdened.

Figure 11. NCHEMS NCES IPEDS Completions Survey: number of Californians earning one to two year awards (2015-2016)

CIP Code	CIP Description	Public 4-Year	Private 4-Year Non-Profit	Private 4-Year For Profit	Public 2-Year	Private 2-Year Non-Profit	Private 2-Year For Profit	Public Less 2-Yr	Private Less 2-Yr Non-Profit	Private Less 2-Yr For Profit	Total
01	Agriculture, Agriculture Operations, And Relatec	-	-	-	241	-	-	-	-	-	241
03	Natural Resources And Conservation.	-	-	-	14	-	-	-	-	-	14
04	Architecture And Related Services.	-	-	-	74	-	-	-	-	-	74
09	Communication, Journalism, And Related Progra	-	-	-	213	-	-	13	-	20	246
10	Communications Technologies/Technicians And	-	-	82	384	-	3	5	-	232	706
11	Computer And Information Sciences And Suppor	-	-	55	450	-	173	19	-	18	715
12	Personal And Culinary Services.	-	-	190	1,712	-	869	65	-	5,052	7,888
13	Education.	-	95	7	81	-	-	-	-	-	183
14	Engineering.	-	-	-	56	-	-	-	-	-	56
15	Engineering Technologies And Engineering-Rela	-	-	62	738	-	-	16	-	-	816
19	Family And Consumer Sciences/Human Sciences	-	-	-	1,004	-	-	-	24	-	1,028
22	Legal Professions And Studies.	-	26	9	341	-	6	-	-	2	384
26	Biological And Biomedical Sciences.	-	-	-	9	-	-	-	-	-	9
27	Mathematics And Statistics.	-	-	-	18	-	-	-	-	-	18
31	Parks, Recreation, Leisure, And Fitness Studies.	-	-	-	46	-	5	-	-	109	160
40	Physical Sciences.	-	-	-	21	-	-	-	-	-	21
41	Science Technologies/Technicians.	-	-	-	37	-	-	-	-	-	37
43	Homeland Security, Law Enforcement, Firefighti	-	-	-	1,024	-	-	-	-	446	1,470
44	Public Administration And Social Service Profess	-	-	-	167	-	-	-	-	-	167
46	Construction Trades.	-	-	303	564	-	131	73	343	116	1,530
47	Mechanic And Repair Technologies/Technicians.	-	-	27	1,573	-	518	18	108	634	2,878
48	Precision Production.	-	-	-	414	-	-	-	306	-	720
49	Transportation And Materials Moving.	-	-	-	113	-	-	-	-	-	113
50	Visual And Performing Arts.	-	41	449	550	-	-	-	-	23	1,063
51	Health Professions And Related Programs.	-	153	1,945	3,088	186	10,409	187	476	7,389	23,833
52	Business, Management, Marketing, And Related	-	2	22	1,636	-	193	24	218	615	2,710
99	Total	-	317	3,151	14,568	186	12,307	420	1,475	14,656	47,080

The interpretation of these data points and considerable discussion leads to the conclusion that the initial target population for the FLOW statewide, online community college should be the almost 50% of Hispanic Californians between the ages of 25 and 34 who have at least a high school credential, or some college but no degree. As the NCHEMS analyses indicate, most of these people are working but may not have the skills and knowledge to advance their own careers, make a living wage, and contribute fully to the future economic development of California.

As Figure 12 indicates, the FLOW target population hold jobs in a wide variety of industries but are concentrated in a few. This information jump-starts the planning for which industries to target initially for partnerships.

Figure 12. California Average Annual Employed Hispanic Population Age 25-34 by Education Level and Industry - 2011-15

Just High School Diploma/GED or Some College No Degree		
Industry Title	**Number Employed**	**Percent of Total Employed**
Total	893,927	100.0
Retail Trade	135,771	15.2
Health Care and Social Assistance	108,176	12.1
Accommodation and Food Services	96,524	10.8
Manufacturing	84,560	9.5
Construction	78,505	8.8
Administrative and support and waste management services	57,575	6.4
Other Services, Except Public Administration	49,022	5.5
Transportation and Warehousing	44,908	5.0
Finance and Insurance	36,494	4.1
Wholesale Trade	34,271	3.8
Educational Services	28,910	3.2
Professional, Scientific, and Technical Services	26,902	3.0
Public Administration	25,051	2.8
Agriculture, Forestry, Fishing, and Hunting	23,285	2.6
Arts, Entertainment, and Recreation	18,025	2.0
Real Estate and Rental and Leasing	16,007	1.8
Information	14,760	1.7
Active Duty Military	5,775	0.6
Utilities	5,702	0.6
Mining, Quarrying, and Oil and Gas Extraction	3,366	0.4
Management of Companies and Enterprises	338	0.0

Source: U.S. Census Bureau, 2011-15 American Community Survey Five-Year Public Use Microdata Sample.

NCHEMS used Burning Glass data to create a picture of the current demand at the sub-baccalaureate level for different regions of California. Figure 13 is a snapshot of California as a whole. The larger the bubble, the higher the number of jobs that are being advertised in fall of 2017. The bubbles to the farthest right indicate higher salaries. It shows that the good wage jobs in high demand are in the healthcare industry, manufacturing, finance, clerical and administrative, plus maintenance, repair and installation. All these jobs require education beyond high school. The full interactive model NCHEMS built can be seen at https://goo.gl/imAKv8. It enables the user to explore the career demands by region of the state and to also see what skills are required for the various jobs within the career clusters. An example is found in Figure 14. The tool can be used to help program designers understand the needs for different types of jobs in different regions of the state. The program designers can also use the tool as an additional source of information when working with statewide industry associations or employers when developing programs that respond to workforce needs.

Figure 13. Jobs Demand Throughout California as Displayed in the NCHEMS Interactive Tool

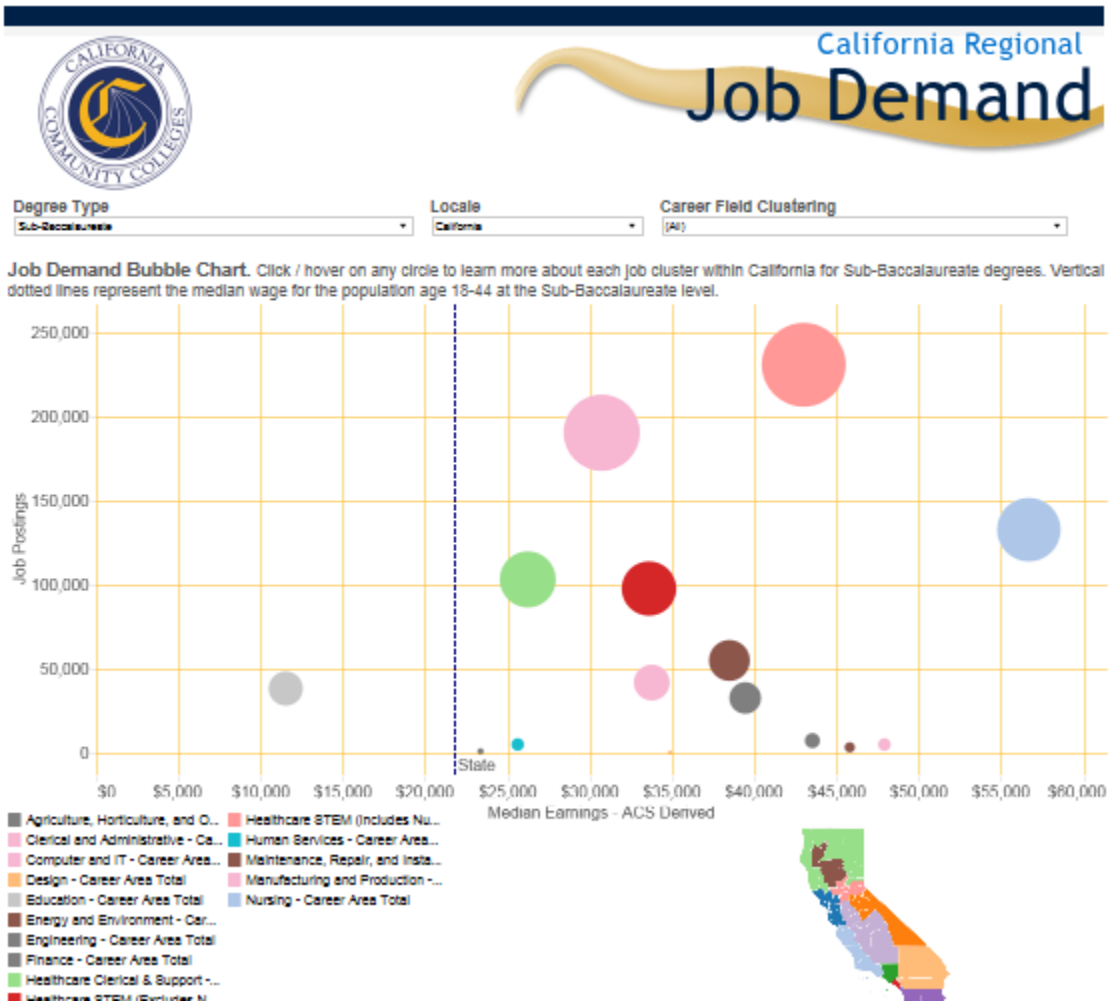


Figure 14. Skills Associated With Specific Jobs Listed in Advertisements for the Health Care Career Cluster (STEM)

Occupation Details. Click on any occupation to see the associated skills. Hover over the postings or earnings data for a description of that occupation.

Occupation	Average Annual Job Postings	Median Earnings
EMT / Paramedic	5,580	$30,756
Intensive / Critical Care ..	11,882	$61,513
Licensed Practical / Voc..	27,244	$34,857
Massage Therapist	9,171	$18,173
Medical Assistant	24,262	$25,032
Pharmacy Technician	11,949	$30,756
Phlebotomist	6,896	$33,319
Radiology Technician	6,617	$49,229
Registered Nurse	89,933	$61,513
Surgical Technician / Te..	3,627	$30,756

Skill Posting Rank. Top five skills requested by employers nationally (source: Burning Glass).

Occupation	Skill Type	Skill (in rank order)
Pharmacy Technician	Foundational	Customer Service
		Organizational Skills
		Communication Skills
		Quality Assurance and Control
		Writing
	Specialized	Pharmacy Technician
		Pharmacist
		Pharmacist Assistance
		Prescription Filling
		Labeling
	Software	Microsoft Excel
		Microsoft Office

As the data collected for the FLOW project make clear the design considerations for the project, point to a target audience of working adults that need to be supported differently than students coming directly out of high school who are less likely to be employed and have families.

Technological Realities for Target Populations

It is critical that arrangements be made to make assignments and assessments accessible to working, adult students. In addition to examining high-enrollment online institutions and programs, NCHEMS also explored the types of technologies available to the population that FLOW is targeting. While some sets of assignments and assessments will require access to computers (which can be found at most public libraries, through partnerships with school districts, and local community college campuses), the students' own cell phones can be counted among technological resources available to facilitate learning. There is a body of evidence suggesting that cell phones will be an almost ubiquitous tool for reaching students. This is recognized by the major companies selling platforms for educational distribution that are all working to assure their tools are mobile enabled. Cell phones can facilitate voice communication, short quizzes, as well as short learning modules. An example of cellphone-based student interaction is EdTech Center's Mobile Up! collaboration:

Mobile Up! – Cellphone First Education for Low-Wage Workers[i]

- English, Career Technical Education and coaching by cellphone designed to help immigrant adults and other low-wage workers in high-growth industries gain skills and advance their careers.
- Why Mobile? The following data come from a survey conducted September 29, 2016 – November 6, 2016 by Pew Research Center (link: http://www.pewinternet.org/fact-sheet/mobile/):
    - 95% of individuals in the United States have a cellphone of some kind.
    - 77% own smartphones (up from just 35% in Pew Research Center's first survey of smartphone ownership conducted in 2011).
    - 18% are simple phones.
    - 69% of individuals in the U.S. with educational attainment of a high school diploma or GED have a smartphone.
    - 80% of individuals in the U.S. with educational attainment of some college, no degree have a smartphone.
    - 64% of individuals with household incomes below $30,000 own a smartphone.
    - Many smartphone users don't have traditional home broadband service.
    - Reliance on smartphones (instead of home broadband) for online access is especially common among younger adults, non-whites, and lower-income individuals.

While the level of access to cell phones is useful information, an organization called Cell-Ed ran experimental pilots for an adult education program in the Los Angeles area delivered through cell phones in order to study its effectiveness. In short, the program:

- Teaches adults (15+) basic skills for jobs and life on any mobile phone through call, text, or click three-minute lessons and personalized learner support;

- Is a cross-platform 24/7 solution with no internet required; and
- Provides interactive text and audio instruction that is automated and customized.

There are many limitations to offering a full educational program using a cell phone distribution strategy but they did find the following:[ii]

- Proven effective in randomized controlled trial, product testing, and ongoing monitoring and evaluation;
- Learning gains observed in both stand alone and blended models;
- Found learners studied at all hours and in own ways;
- Learners connected with an "audio" virtual teacher;
- Texting works (99% open rate)
    - Learners like texting to practice writing
    - Learners like instant feedback
- Distance teaching and coaching by cell phone works;
- Peers can help introduce others to technology; and
- Empowered learners to be self-directed
    - Learners reviewed past texts "just in time"
    - Learners proactively contacted bilingual coaches for help
    - Learners requested additional learning resources and referrals to education/training and jobs
    - Students started researching resources themselves and running them by the coach
    - Students asked for career advice.

"Digital Diaspora," a November 2012 report by the nonprofit *Welcoming Center for Pennsylvanians* details the findings from a study on technology usage by select Philadelphia immigrants. (Link to full report: http://www.immigrationresearch-info.org/report/other/digital-diaspora-how-immigrants-are-capitalizing-todays-technology)

Their data suggests a previously undocumented level of technological fluency and activity among this population:

- Attitudes and usage held steady across an extraordinary diversity of ethnic, linguistic, educational, and socioeconomic backgrounds.

The "Digital Diaspora Report" cites the following national research findings (link to full report: http://www.thehispanicinstitute.net/files/u2/Hispanics_and_Broadband_Access_0.pdf)

- "National research indicates that 40% of Latino immigrants are coming from countries where mobile phone usage is more widely available than landlines."
- While Hispanics trail other U.S. populations in overall Internet access, they are among the most avid users of mobile broadband. Hispanics and African Americans lead mobile

broadband use (53% and 58% respectively), with both communities far ahead of Whites (33%).

- "Immigrant users are investing in both hardware and unlimited usage plans – buying smart phones even when they have limited income. All indications suggest that this investment is occurring equally strongly among individuals who have limited English proficiency and those who have limited literacy in any language."

Additional information comes from an interview with the lead author on the study that resulted in the Digital Diaspora report, Amanda Bergson-Shilcock, Director of Upskilling Policy at the National Skills Coalition.:

1. People are really smart and savvy about using mobile and tech tools to do things they want to and have urgency to do.
2. The idea of fractured knowledge: a grandparent may know how to text someone to send a picture of a grandchild but might not know how to pay a bill online; just because you use the technology tool well in one area does not mean you do not need assistance using it in another area. Many immigrants come from countries where there is much greater use of mobile phones than landlines— in a way, they are ahead of others because they are accustomed to using mobile phones for getting various tasks done.
3. It is critical to design for your audience, realizing what resources and abilities they have. For example, it would be a mistake to require flash player to receive a lesson or complete a task if you do not know for sure that the device the learner will be using has flash player. Another example is requiring a learner to complete a task in one sitting (i.e. no option to save progress and return at a later time) when the learner may be using computers in the library for access that have a time limit which would mean they get locked out of the computer before having enough time to complete the task.

Obviously most academic programs could not rely exclusively on cell phone technology so FLOW students would need to have some access to laptops and broadband. California policy makers are concerned with having low connectivity throughout the state. In fact, just recently bill 1665 was passed in both houses and was sent to the Governor for signature. This bill is the result of the successful negotiation of a $330 million bill package to expand broadband access and digital literacy in communities deprived of a reliable internet connection.

Supporting Working Adults in Online Education

Connecting Credentials,[iii] a non-profit group working with education and industry partners to better understand credentials, badges, etc. and their value to awardees, has recently released a report that does a good job of characterizing the important elements needed to fully support working adult students. These elements include:

- **Financial aid** – Federal rules prohibit financial aid for "smaller credential" programs (which may well be valuable for career path entry). Also, adults may be going to school part-time and not taking enough credits to qualify for a Pell grant or other financial aid. Note that this Pell Grant restriction may be lifted in the near future.
- **Dealing with educational debt** – Prior unpaid tuition is a huge obstacle for many adult learners, preventing release of past transcripts and credits. Flexible rules and aid in paying off back tuition are needed to enable returning students to pay off back tuition debt.

- **Placement/Locality** – Where and when providers offer training matters; location may be a long way from a learner's home or job, particularly in rural regions and in urban centers with weak public transportation systems. Workers reentering postsecondary education often need courses to be available at nontraditional times and days as well as in nontraditional modalities, such as distance learning.
- **Academic preparation** – Many entering adult learners need to strengthen foundational skills without derailing academic/occupational paths.
- **Flexible, inclusive credit transfer and credit for prior learning** – Adult students enter postsecondary education with many strengths, assets, and skills which often go unrecognized in the credentialing process.
- **Family needs** – Adult learners come with a full life of circumstances to manage including care for dependents – children to adults.
- **Support needs** - Transportation, secure housing, food, child care, counseling, wellness and mental health services are major examples of widely felt needs.
- **Pathway navigational help** – Many adult learners need help in understanding how to navigate through educational institutions, learning plans, and career pathways.
- **Coaching/mentoring** – Adult learner success increases significantly when they receive consistent support, which can come from a coach, a mentor, and/or becoming part of a cohort of learners.
- **Special needs populations** – Some adult learners face barriers that are specific to their circumstance - for example, Opportunity Youth (those returning to their community from incarceration), and persons with disabilities or advanced age.

Other Sources of Information

In addition to compiling information about the general services needed for adult students to be successful, NCHEMS collected information on large scale online post-secondary programs and found the following.

I. From Arizona State University data

A summary of facts on online learning show efficacy with minority students, backed up by Action Lab at EdPlus research.

- For ASU's programs**, online and face-to-face learning produce comparable results** for completing, passing, and mastering course material.
- Results across 257 courses offered online, 1 million student-course sample indicated **only very small or no differences across different genders and ethnicities in online course completion, passing and mastery** relative to face-to-face.
- The ASU results add to a body of literature suggesting that **delivery modality – online vs. face-to-face – may now be an artificial distinction.** Online learning is in general as efficacious as face-to-face.

- Online learning, particularly in **blended online learning courses as well as adaptive offerings, have consistently outperformed traditional classroom teaching**.
- Online learning provided the best net return across access, outcomes, and economics versus traditional methods, in that it provides more flexible scheduling for students and can contribute to improved retention and graduation rates.

Summary: Overall, the ASU research showed results consistent with online learning providing improved access, outcomes and economics to a broadly diverse socioeconomic student population. The ASU findings on enrollments also show slightly higher share of Pell students and an increase in both female, African American, and older student population, in part due to offering greater flexibility for students with work or family commitments.

II. Rio Salado College, AZ data[iv]

As reported in the Voluntary Framework of Accountability (VFA), AY 2014 – AY 2016, that benchmarked Rio Salado College (primarily online) student performance against student performance at 171 community colleges across the country. The data is disaggregated to view underrepresented minority student success.

- Two year completion rates for degree and/or certificate completion:

  Rio Salado College students completed degree or certificates at higher rates within the following demographic groups:

  - American Indian/Alaskan (15.5% to 9.1%)
  - Black (11.1% to 7.1%)
  - Hawaiian/Pacific Islander (17.4% to 11.1%)
  - Hispanic (19.5% to 11.4%)

- Two year transfer rates (without having earned a degree or certificate):

  Rio Salado College students had higher transfer rates within the following demographic groups:

  - American Indian/Alaskan (25.4% to 12.8%)
  - Black (28.0% to 20.3%)
  - Hawaiian/Pacific Islander (34.8% to 15.2%)
  - Hispanic (28.1% to 13.4%)

- The VFA data show that Rio Salado College's Hispanic students have a higher first term credit success rate than those at the benchmarking institutions (72.5% to 69.0%), however the other disaggregated demographic populations have lower first term credit success rates than those at the benchmarking institutions.

III. The Public Policy Institute of California reported on an extensive review of academic literature and interviews with eight online-education specialists in the California community college system, including faculty and distance-education coordinators. The report highlights the following key areas for making students successful in online learning :[v]

- It is critical to move away from the individual, faculty-driven model of online course design and delivery toward a model under which faculty members collaborate with administrators, media developers, and information technology experts. This more systemic model is more conducive to ensuring quality by creating teams with a range of skills that a single instructor is unlikely to have;
- Faculty members must receive appropriate training and ongoing professional development in order to maximize the potential of the online learning environment (instead of the frequent practice of simply trying to create an online version of a traditional course, taking little account of the differences in learning environment);
- Students need additional support in the online learning environment and this is economically viable only if instructional functions are performed differently;
- Setting expectations (dispelling the myth that online courses are less rigorous than traditional ones is part of this) and preparing students to make the best possible use of online learning technology is an important best practice; and
- Regular and effective interaction between students and instructors, among students, and between students and the online course material is essential to establish a successful online learning environment.

IV. Oregon State University

Oregon State University has developed a new research database (see ecampus.oregonstate.edu/research-database) that allows users to explore whether the learning outcomes of online education are at least equivalent to face-to-face environments and explore what components are critical for effective online learning. The database is searchable by a range of categories including year, sample size, and discipline, and whether an article is peer reviewed.

Considerations for Design

Based on the evidence presented above, the research on how to serve working adults, and the insights shared by experts, the FLOW workgroup developed the following list of factors that should drive the design characteristics of the options:

- Very large scale capacity is critical for any option;
- Must be economically sustainable over time;
- Must be designed for underserved Californians
  - Initial target populations have educational attainment of at least high school diploma or GED or some college, but no degree
  - Must offer Spanish language options especially with student intake and student support interventions; programs should become English only by their conclusion
  - Must be culturally appropriate;
- Must reflect student centric, not institutionally centric, design
  - Not tied to academic calendars

  - Asynchronous access to learning materials — to recognize time constraints of adult learners
  - Any fundamental skills development must be managed as co-requisite with centralized support for language, writing, and/or computational skills (e.g., vocational ESL is a good starting point for micro-credentials);
- Significant tech-enabled student supports must be embedded as well as technologically enable person-to-person support
  - Should assume that students will tap into the support on weekends, late at night, and other irregular times
  - Must meet ADA requirements
  - Will require a high-touch component (intrusive student monitoring and interventions);
- Students need access to financial assistance
  - Price must be affordable
  - Employers could provide tuition aid
  - Variable sources of aid must be available
  - Any state subsidy must be set up appropriately
  - Portability of student aid must be allowed
  - Must be available regardless of citizenship status;
- Initial credential should be sub-associate degree (micro-credential), stackable into transferable credits, and rigorous;
- All certifications must be employer valued and sensitive to regional job opportunities that pay a living wage (documented high value);
- Third party assessments should be used to ensure rigor and acceptance by employers;
- Skills must be linked to industry standards that translate into competencies, enabling competency-based education (CBE) as part of any option.

  CBE allows/requires:
  - Time-independent progress to a credential
  - Learning materials be available anytime and anyplace
  - Subscription pricing with full costs bundled into the price
  - Demonstration of outcomes achieved needed to indicate progress through the program and eligibility for award of certification
  - Rigor built into the program/course design;
- Evaluations of success should be based on metrics developed jointly by educators (faculty and psychometricians) and employers;
- Any consortium or cooperative of program providers must have investment by the member colleges;

- Utilize common infrastructure
  - Adherence to common set of educational technologies, data interoperability, and open standards (including Open Educational Resources [OER] where appropriate)
  - Student specific records centrally maintained
  - Learning materials are centrally created and managed
- Mobile-technology enabled services are critical as is access to broadband and a computer/laptop, however student support services can start with voice.
- Must explore options for regulatory relief as existing roles in the system do not transfer well – skills and duties of faculty and non-academic staff will need to differ if the above considerations are to be met; and
- Marketing/outreach cannot be an afterthought.
  - Centrally provide marketing support can be customized for the target segment
  - Designed for regional workforce realities
  - Working closely with employers to recruit students.

Scenarios illustrating how the FLOW model can benefit California's working adults can be found in the section following Cost Considerations.

Options for FLOW

Based on the data and information provided, the FLOW workgroup discussed four options that could be forwarded to the Governor and Chancellor in response to the charge given. There was not universal agreement on these options, but rather they are the result of weighting many different points of view regarding structure, financial feasibility, and flexibility. In addition, these options are not recommendations, and are not mutually exclusive. The options are:

- Create a FLOW unit with a statewide mission within an existing institution;
- Establish FLOW as a consortium of colleges hosted by an existing institution;
- Create a new FLOW district to develop and deliver fully competency-based programs;
- Establish FLOW as an extension of the existing Online Education Initiative (OEI)

Common to each of the three options are the following set of design features:

- **Workforce Orientation**. Employer engagement and industry partnerships will assure the credentials earned by students will actually lead to employment or to skills-building in ways valued by the employer. Accordingly, all program materials will be co-developed or approved by college faculty and industry experts. Many industry associations already exist, e.g. auto dealers, hospitality, travel, food chains, hospital chains, other healthcare groups; these could be the starting points. The state itself would also be an employer with which to partner.
- **Credentials**. The programs will result in micro-credentials, designed so they can be combined for transferable credit toward more traditional CTE certificates and associate degrees.
- **Course Scheduling**. Each option will move away from a traditional academic calendar to enable a more flexible schedule for students.
- **Program Delivery**. Program delivery is statewide. Academic programs can use the Canvas platform under the statewide license. This platform may require some modification for competency-based programs and needs to be compatible with mobile delivery.
- **Student Costs**. Student payments could be on a subscription model which is the norm now for the marketplace. That is, students pay a fixed, all-inclusive rate for unlimited access to courses and services for a specified number of months.
- **Student Support**. The target population requires specialized support services. A high level of support (technology-enabled but paired with person-to-person contact) will accompany the student's personalized academic journey.
    - CCC technologies deployed to support Guided Pathways will support FLOW. Additional, targeted resources—including a 24x7 virtual help desk available in English and Spanish—will be added.
    - cccMyPath/FLOW would be created as the student landing page using the FLOW 'skin'.
    - An opportunity to provide system wide student services.

- **Student Assessment**. Design of assessments and evaluation/scoring will be done by different groups of faculty to promote objective and consistent assessment of student learning. Assessments will take many forms (tests, demonstrations, projects, etc.) and evaluators will be selected for their expertise. Some types of assessments can be automatically scored (e.g. multiple choice tests). These are very useful for formative assessments. Proctoring (either electronic or face-to-face) would be required for any summative assessment that would count toward a credential.
- **Regulatory Relief**. In order for any of the options to be successful, it is recommended that regulatory relief be considered. However each option has different issues regarding regulatory relief:
    - Option 1. Regulatory relief to enable different practices could be difficult to obtain for a subset of academic programs, while not applying to other programs in the same college. Granting such relief could face pushback from within the college. Not granting relief could mean that special services for the target population would have to be provided under existing structures thus increasing costs, or that adequate support services could not be provided.
    - Options 2 & 4. Regulatory relief to enable different practices and staffing patterns could be difficult to obtain for programs comprising a small part of many colleges' offerings.
    - Option 3. Regulatory relief might be easier to obtain, particularly if the new entity is set up like a new organization. The relief could allow different staffing patterns for faculty and non-academic staff that would enable financial sustainability for service to large numbers of Californians.
- **Funding.** For any option chosen, the state could provide on-going categorical funding to support core operations.
- **Definition of Student Success**. Success would be measured based on outcomes and could incorporate the essential employability qualifications like the Essential Employability Qualifications developed by the Quality Assurance Commons.[vi]
- **Faculty Development**. FLOW will use resources already available through the Online Education Initiative (OEI). If needed, these could be further developed for competency-based programs. The instructional design team within the OEI can also help faculty incorporate adaptive learning modules into the curriculum where appropriate.

It is important to note that for each of the four options presented, there may be significant push back from traditional community college personnel.

Each option has a different timeline for staffing up and scaling to serve a target level of 45,000 students within seven years. This target was chosen based on a conservative estimate of the demand and to allow a budget to be developed.

The FLOW workgroup did not discuss the notion that all programs need to be developed as competency-based education (CBE), but did discuss the need to put a strong emphasis on assuring high quality. All the options could be able to incorporate CBE. It is the case that using a competency-based design with high thresholds for demonstrating proficiencies can assure rigor and appropriate outcomes to meet employer/industry needs. Each of the options is described below.

Option 1 – FLOW unit with statewide mission within an existing campus

Activities	Performed by/ scope	Comments
Management	Single campus	Using the overall design considerations.
Academic program development	Campus faculty and instructional designers	College would be responsible for employing or contracting the instructional designers and ensuring they apply FLOW design criteria.
Student support	Campus staff (academic and non-academic) /partners	In addition to using existing student support services, college would have to provide extended hours and alternative modes of delivery to meet target population's needs.
Student records	Campus' Student Information System (SIS)	The existing SIS may need to be modified to fit non-semester dependent learning experiences.
Program choice & employer relationships	Campus staff and faculty	In addition to relying on existing local and regional employer relationships, college would need to develop new ones statewide.
Quality Assurance	Chancellor's Office	In addition to district's and college's regular quality assurance processes, Chancellor's office would review activities and compare them to the design considerations to assure FLOW model adherence.

Pros:

1. Could enable a college or educational entity to push the evolution of its current practices to meet requirements for the target population.
2. There would be an organizational structure already in place.
3. An already accredited entity could open door to Title IV federal aid if the program is at least 12 months in length. Students could also be eligible for federal training funds currently in place and probably more to come. Some of the funds from which students could draw include EITC, SNAP, CalWORKs, Employer Training Panel and the like if eligible.
4. Would have existing CTE certificates and have degrees into which micro-credentials could "stack."
5. Could offer a campus the opportunity to develop competency-based education programs.

Cons:

1. Constrained by existing structures, policies, processes and procedures (e.g. development and approval processes and timelines, delivery mechanisms designed for existing student population that might not serve FLOW students effectively, and financial and student record systems designed for the traditional academic calendar).
2. If students needed access to resources in their local community, financial reimbursement arrangements would have to be made by the FLOW college.
3. Uncertain whether an existing entity, with its current structures, could operate at a scale and cost needed to accommodate the numbers of Californians that need services.
4. Local governing board's priorities could conflict with state's broader priorities.

Option 2 – FLOW Consortium of Colleges Hosted by an Existing District

Activities	Performed by/ scope	Comments
Management	Existing district organizing collaborating colleges	One example is that the collaborating colleges could invest in the College Owners Association (COA) in order to share in the cost of coordination and play by the pre-established rules.
Academic program development	Faculty from colleges in the COA	District would be responsible for employing or contracting the instructional designers and ensuring they apply FLOW design criteria.
Student support	District support staff	Keeping support for students under one district can ensure consistent quality. District likely would have to develop the targeted services (which typically are provided at the college level).
Student records	District Student Information System (SIS)	District would have to acquire an SIS or create a new "instance" of an existing SIS. An existing SIS may need to be modified to fit non-semester dependent learning experiences.
Program choice & employer relationships	District would manage this process	In addition to relying on existing local and regional employer relationships, district would need to develop new ones statewide.
Quality Assurance	Chancellor's Office	In addition to existing district's regular quality assurance process, it would have to provide types of program oversight typically done at the campus level. Moreover, Chancellor's office would review activities and compare them to the design considerations to assure FLOW model adherence.

Pros:

1. In one version, each college would have an investment in the consortium it joins, and the state could match that investment. There would have to be a commitment for a specified period of time before which any college pulling out would not see a return on its investment. This would lower the state's direct expenses for start-up operations. Any excess revenue would be returned to the investors after the 5 to 7-year start-up period.
2. Both academic and non-academic services could be improved through specialization, with different participating colleges serving specific groups of Californians.
3. Consortium colleges could be non-geographically contiguous to provide greater geographic coverage.
4. The participating colleges would likely have strengths in different programmatic areas allowing more rapid start-up.
5. The sponsoring district may be able to achieve access to financial aid through one of its existing colleges (depending on the parameters of the educational programs). Students could also be eligible for federal training funds currently in place and probably more to come. Some of the funds from which students could draw include EITC, SNAP, CalWORKs, Employer Training Panel and the like, if eligible.

6. Colleges would have existing CTE certificate and degree programs into which micro-credentials could "stack."
7. Would create a broader impetus for innovation across multiple colleges.

Cons:

1. Complicated to manage with member colleges having competing priorities and intrinsic constraints based on past practices.
2. May be difficult to create competency-based programs that can fit within the existing colleges' systems, but not impossible.
3. Oversight and accountability measures cannot be the same as the status quo, but changes to existing oversight and accountability structures may not be possible if existing colleges are the providers and 'owners' of the consortium. The hosting district would have to establish appropriate accountability and oversight for a group of institutions.

Option 3 – New FLOW district, operating under the CCCCO and fully competency-based

Activities	Performed by/ scope	Comments
Management	FLOW district	Created by the CCCCO. Chancellor with statewide Board of Governors hires chief executive officer.
Academic program development	Faculty at California colleges working with instructional designers, and employer advisors	The FLOW district would issue Requests for Proposals to the CA colleges for the programs to be offered statewide. Instructional designers would work for the FLOW district.
Student support	FLOW district	Specialized student support personnel (including both faculty members and non-academic staff) hired specifically for FLOW, would work directly with students to keep them on-track. They would be assisted by appropriate technology.
Student records	FLOW district	An SIS that is compatible with most of the colleges (to facilitate simple credit transfers) would be contracted from an existing CA college/district or licensed by the Chancellor's office.
Program choice & employer relationships	FLOW district	Relationship development would follow current navigator model to reach from statewide to regional/local.
Quality Assurance	FLOW district with external evaluator	In addition to new district's regular quality assurance process, which would include external evaluation, Chancellor's office would review activities and compare them to the design considerations to assure FLOW model adherence.

Pros:

1. Regulatory relief might be easier to obtain, particularly if the new entity is set up as a new organization. The relief could allow different staffing patterns for faculty and non-academic staff would enable financial sustainability for service to large numbers of Californians.
2. Embedded, tech-enabled student supports could be built in as part of the design phase.
3. The centralization of the design criteria of learning materials (either created or acquired) will assure they meet the requirements of working adults as laid out in the design considerations and utilize appropriate technologies. College faculty (with employer input) would create the curriculum.
4. Could be eligible for federal training funds currently in place and probably more to come. Some of the funds from which students could draw include EITC, SNAP, Cal Works, Employer Training Panel and the like, if eligible.
5. More easily designed in ways that do not require traditional academic calendars.
6. May be easier (have the capacity) to license/purchase learning resources.
7. Agility to reach market could accelerate as a startup.
8. The Student Information System (SIS) and financial record systems would be designed explicitly to deal with the flexible delivery methods of the FLOW district.

Cons:

1. If full degree is not offered, not eligible for Accrediting Commission of Community and Junior Colleges (ACCJC) nor the national Distance Education Accrediting Commission (DEAC) recognition as a possibility avenue for federal financial aid nor Cal Grants (in their current form). Student outcomes would have to be tracked and validated as an index of quality (see Quality Assurance Commons' Essential Employability Qualifications https://theqacommons.files.wordpress.com/2017/04/theqacommons-drafteeqcertcriteria-6-14-17.pdf as an example of emerging projects that try to address the limitations of our current accrediting system).
2. Would not have existing degrees into which micro-credentials could easily "stack." To accomplish this requirement, the FLOW district would have to negotiate agreements with existing colleges.
3. Would not have previously established ties to employers.
4. Student support services would be limited to person-to-person phone conversations until agreements were negotiated with other support agencies throughout California.

Option 4 – Status Quo with Enhancements

Establish FLOW as a unit within the Chancellor's Office (e.g., Online Education Initiative (OEI). In this option:

A. Individual campuses continue to develop and deliver their own programs.

B. There is a coordinating and support entity attached to the Chancellor's Office (possibly an enhanced OEI) that:

   a. Provides statewide advertising and outreach services.

   b. Provides technology and data systems support.

   c. Continues, and broadens, current OEI support services (faculty development, etc.).

   d. Ensures that outcomes produced by campus programs are aligned with employer needs and that third party assessments are utilized wherever possible.

   e. Solicits development of programs if there is a mismatch between employer need and available programs.

   f. Maintains a portal through which potential students can obtain information about workforce programs offered by all California community colleges.

Activities	Performed by/ scope	Comments
Management	Chancellor's Office (potentially expanding OEI)	CCCCO would have to create a separate unit within the current structure (incorporating and expanding the functions of OEI), to oversee and support the overall design considerations.
Academic program development and delivery	Faculty at colleges in the community college system	OEI could provide support by employing or contracting instructional designers that would work with college faculty and ensure they apply FLOW design criteria.
Student support	OEI and participating community college staff	OEI staff would coordinate staff at participating colleges to ensure that both extended hours and alternative modes of delivery to meet target population's needs are provided.
Student records	OEI Student Information System (SIS)	OEI would need to coordinate student records among the various colleges' SIS systems.
Program choice & employer relationships	Faculty and staff at partner colleges would take the lead in order to leverage their existing connections	In addition to managing the process – the coordinating entity would have to establish new statewide partnerships and rely on existing local and regional employer relationships through the participating colleges.
Quality Assurance	Campuses offering the programs	Campuses would provide their usual quality assurance process and program oversight. The Chancellor's office would review activities and compare them to the design considerations to assure FLOW model adherence.

Pro:

1. Using an established infrastructure that helps collaborate across campuses.
2. Existing OEI participating colleges *might* shorten time to launch (as colleges would likely have strengths in different programmatic areas), but adding staff to OEI to accomplish a new mission may not improve start-up time.
3. The existing colleges could collaborate to create one-stop shops for students to find on-line opportunities and receive student services.
4. The individual colleges would be providing programs so after undergoing a substantive change review students may be eligible for financial aid (if the program meets the federal requirements regarding length, etc.). The coordinating entity may be able to make a student's financial aid transportable regardless of which college within the California CCs the student attended. Students could also be eligible for federal training funds currently in place and probably more to come. Some of the funds from which students could draw include EITC, SNAP, CalWORKs, and the like, if eligible.
5. Colleges would have existing CTE certificate and degree programs into which micro-credentials could "stack."
6. Would be the option with the greatest support from the colleges and their faculties.

Cons:

1. Complicated to manage with participating colleges having competing priorities and intrinsic constraints based on deeply ingrained policies and practices.
2. Constrained by existing structures, policies, processes and procedures (e.g. development and approval processes and timelines, delivery mechanisms designed for existing student population that might not serve FLOW students effectively, and financial and student record systems designed to work only on one campus).
3. May be difficult to engage staff/faculty members in different types of work than has been the case in the past, as FLOW is made part of the established structure of the community college system.
4. May be difficult to move quickly and scale up. California's prior experience in a similar endeavor (OEI's work) has been focused on associate degree completion – this new initiative would expand the mission to include CTE programs, sub AA programs and certificates, and engage in workforce development. This change in focus could take time.
5. Oversight and accountability measures that stay with the college providing the program may result in inconsistencies for FLOW students.
6. Likely to be difficult to obtain the necessary regulatory relief for (potentially) all community colleges in the system.
7. Existing campus programs on which FLOW would depend for initial content were designed to serve a local workforce market. Expanding their reach to statewide audiences will require relief from constraints on marketing outside district boundaries and considerable support from the coordinating entity.

Cost Considerations for Flow Model Options

Assumptions Underlying Cost Estimates

Rough cost estimates have been made for each of the first three options. The fourth option was added late and the assumptions under which it might work would be basically the status quo funding with enhancements to enable service to the target population. The first three options have several factors in common, but they differ in some key areas. Estimates for all three options have the following cost elements in common:

- A Directors Office responsible for the overall management and coordination of the endeavor.
- A head of partnerships development and staff to develop partnership arrangements with employers and employer associations.
- A Chief Instruction Officer – on the assumption that this is a sufficiently large undertaking that it cannot be added to the workload of the campus CIO.
- A Finance Office – responsible for ensuring that the bursar and accounts payable functions are incorporated smoothly into campus functions (or are established separately to meet the specific requirements of FLOW).
- An Institutional Research (IR)/Data Analytics capacity to allow formative assessments of FLOW operations and the identification of areas in which modifications/improvement are needed.
- Costs of recruiting/on-boarding students. Experience elsewhere indicates that initial costs are high (estimated at $5,000 per matriculant the first year) but becomes smaller over time (estimated at $1,000 per matriculant in year 5).
- A series of start-up investment costs for support systems – student information system (SIS), finance, etc. These are assumed to be smaller in options 1 & 2 where the costs are associated with modifications to existing campus systems. In Option 3 the costs are assumed to be higher as a result of the need to acquire a system specifically for the purposes of supporting FLOW.
- Program development – assumed to be $1,000,000 for each program developed.
- Annual maintenance costs for both programs and supporting systems. The annual costs are estimated at 10% of initial investment costs (except in Option 3 where annual system maintenance is assumed to be half the initial investment).
- Costs of assessments and access to online materials are assumed to be the same in each option.
- Costs for professional development of faculty are included for each option.

The areas in which cost factors vary for different options are as follows:

- In Options 1 & 2 there is assumed to be a cost for quality assurance oversight located at the CCCCO. Since Option 3 is under the direct oversight of CCCCO, this function is embedded in the general operations.

- Option 3 includes costs of rent/insurance/utilities. These costs are assumed to be borne by the host campuses in the other two options.
- Costs of program delivery. This is the area in which costs of the different options are greatest. All options require deep involvement of faculty in the program development activities. Options 1 & 2 assume that program delivery will be done by campus faculty at student /faculty ratios typical for California Community College online delivery. Option 3 assumes that content will be delivered largely electronically with faculty members and others sharing direct support of students as the primary point of contact (student/support person ratios demonstrated as being appropriate elsewhere). Access to full-time faculty acting as content experts will be provided in each program.
- The rough estimate of per student costs derived from application of these assumptions are shown in Table 1. It should be noted that much of the difference can be explained by the underlying assumptions about regulatory relief (or lack thereof). Option 3 assumes that the entity would be established as a new organization and would be free of many of the regulations under which community colleges function (such as the 50% law). If given regulatory relief, Option 1 & 2 could operate at lower costs.

Table 1. Per Student Costs Associated with Each Option

	Year 1	Year 2	Year 3	Year 4	Year 5
Option 1	$10,833	$7,866	$6,410	$5,217	$4,122
Option 2	$10,833	$7,896	$6,888	$5,709	$4,430
Option 3	$9,750	$6,411	$4,867	$3,633	$2,509

Details of the cost calculations are presented in Appendix C.

Revenue Sources

The workgroup discussed the question of revenue sources to support FLOW and all recognized the importance. The possibilities are numerous and include:

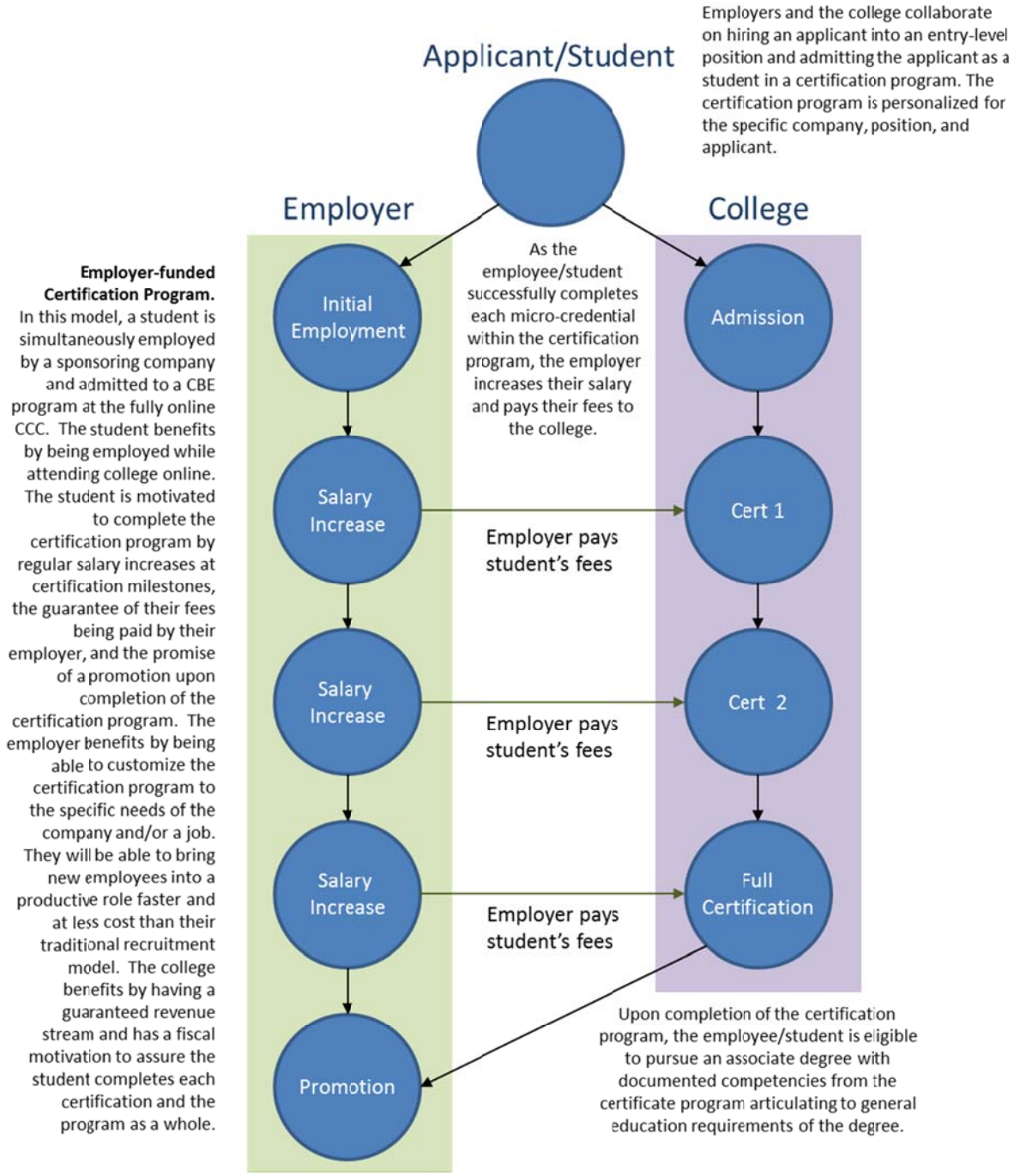
- A direct appropriation from the state. This could be divided into two categories:
  - An initial investment that pays the start-up costs and initial development of both programs and support systems. The investment in recruiting and on-boarding the first three cohorts of students should be included as a start-up cost.
  - On-going support for operations in the form of a categorical appropriation.
- State support through the community college allocation formula – Proposition 98 funds. Since Options 1 & 2 assume that FLOW would be campus-based, this source of funding is particularly apropos for these two options. Since the students will be essentially half-time students, at current rates this would yield approximately $2,500/student. It is also appropriate for Option 3; however, arrangements would have to be made for one of the existing districts to act as fiscal agent for the new entity.
- Students/employers. Prices to students must be kept low – a half-time student in California's Community Colleges pays $630 in tuition over the course of a year. A program tied to

specific work skills with employer/industry commitment for employment could charge a premium; say $750 per student to be matched by the employer. This may be an optimistically high amount for the student component, but employers may be willing to pay more.

Since the programs to be offered by FLOW will be co-designed by faculty and employers to meet industry needs, there is also the possibility of direct employer aid to support students. Joe Moreau (Vice Chancellor of Technology & CTO and CCC Online Education Initiative Executive Sponsor, Foothill-De Anza Community College District) has developed a conceptual model for how employer support for students might work (see Figure 15). The employers with whom he shared it have been enthusiastic. One source of funding for this component may be Employers Training Panel (ETP) funding.

There is a good chance that Options 1 and 2 could eventually result in student access to federal grants and loans through the current Title IV requirements if full degrees or certifications lasting at least one year in length were offered. That is less likely for Option 3 in the near term as there is not an accreditable entity that fits for the Accrediting Commission for Community and Junior Colleges (ACCJC) or Distance Education Accrediting Commission (DEAC) (both require that the entity offer at least one associate's degree). While this could be overcome, it might be wiser to seek other sources for student financial aid. Most higher education policy watchers agree that when Congress actually proposes a re-authorization of the Higher Education Act it is likely to open student aid for more workplace-related programs. In addition, Cal Grants is being reviewed and that may also be a source of aid for the students in programs targeted by FLOW.

Figure 15. Conceptual Model of Employer-Based Student Support



How FLOW Model Can Work for Students

The following brief scenarios show how FLOW can be valuable to working, adult students in a few different areas that are, or may become, fields with high demand throughout California.

Example 1 - Facilities Manager

An area of growing demand for workers is that of facilities managers. Facilities managers are needed in residential, government and commercial facilities such as:

- Manufacturing plants
- Health care facilities
- Schools and universities
- Retail facilities

There is a general shortage of individuals with the necessary skills to fill these positions. Facilities managers are employed in various fields and their specific job duties may vary depending on the type of facility they work for. The general progression of jobs and training towards the facilities manager position varies considerably, but the following is an example of progression of jobs:

1. General facilities maintenance – custodial and minor maintenance tasks.
2. Maintenance of a single system – dealing with specific issues at a level below that of a skilled/journeyman worker.
3. Maintenance of multiple systems with supervisory experience – again at levels below that of skilled/journeyman workers. These individuals have to be able to diagnose problems, fix many of the problems, and know who to call when the problem is beyond their level of skill and knowledge.
4. Facilities Management – overseeing the maintenance of the entire facility; planning and overseeing projects (from creating a project plan specifying the purpose and budget to evaluating project outcomes); handling quality matters such as ensuring and monitoring compliance with codes, regulations, policies, and standards; handling finance and business aspects of the facility such as by developing, recommending, managing and overseeing the facility's budget requirements; handling communications activities such as creating and disseminating reports for stakeholders; ensuring that the facility's technology needs are being met; making sure that the required occupant services (e.g., parking and janitorial services) are being fulfilled satisfactorily; and ensuring that practices support the performance of the facility organization.

To help prepare workers for such jobs, FLOW would operate in the following manner:

- Students would be recruited from among employees with a high school diploma or GED already performing lower level maintenance work and clerical work in various kinds of facilities as well as other individuals with a high school diploma or GED from areas of California that have unfulfilled job openings. The type of individuals recruited could evolve based on evidence as the program matures.
- Skill requirements would be developed in collaboration with employers.

- Learning materials would be prepared for all the job levels outlined above. For each level there are online components (many are open educational resources—OER). Successful completion of the educational activities for each level would result in a high-value certification that all build toward the highest level—Facilities Manager. Students who complete the program will be prepared to pass the International Facilities Manager Association's (IFMA) Essentials certification exam.
- Direct services to support students' learning would be bilingual (English and Spanish at first; other options would be offered as the program matures). When students have questions about the program, their own requirements and funding options, tutoring, coaching, and job placement they could choose English or Spanish.
- The hands-on aspects of the program would be done in the facilities in which students are working or in nearby facilities with supervisors in those facilities serving as coaches.
- Assessments would include demonstrations of skills and knowledge that mimic the worksite.

All online learning materials would be designed to be accessible on mobile technology. Direct student support would be primarily by phone conversations. At the initial levels the learning materials would be available in both Spanish and English (learning materials would be offered in additional languages as the program matures). As learning materials progress through the certification levels they would be increasingly migrated toward English as the ultimate IFMA Essentials certification exam is only offered in English.

The designers of the learning materials will include teams of instructional designers, employers, evaluation specialists, college faculty members, and those charged with delivering the content. Each learning module would be required to map to the specific workforce requirements as well as to components of credit-bearing academic programs, so that credits could be accumulated to satisfy the requirements of an associate degree.

In the FLOW program, students could start at any time (not based on the usual college terms system) and could have access to learning materials and assessments at any time they need them. While students will progress at their own pace, they would need to make a targeted rate of progress to remain in the program. The price of participation would be bundled, so that all costs to the student would be known. To encourage acceleration, the student would pay a fixed price every two or so months regardless of how much of the coursework they can master. It would be a subscription model.

To complete a full degree, the student would enroll in a complimentary program offered by an existing California community college.

Example 2 - Future Workers in the Drone Industry

The operation of the rapidly growing technology of unmanned aircraft requires a range of expertise. People are increasingly using drones in many industries, including:

- Agriculture – hydration needs, security fences for cattle
- Energy inspections of towers, wind farms
- Law enforcement needs
- Insurance industry to check security of job sites, for roof inspections

- Municipalities' infrastructure checks on cell towers, roads, water systems, disease areas

There is a dearth of individuals adequately trained to supply this growing area with the needed workforce. The general progression of jobs and training that would be useful looks like this:

1. Observers – needed because the legal use of drones requires constant visual contact that can be part of a crew working with a licensed pilot to extend the coverage for any drone flight.
2. Operators – able to pilot drones under the direction of a pilot in charge (PIC), but need training to protect the investment of the drone itself (the cost of a single drone can be in the tens of thousands of dollars) and to protect against liability to other property associated with the drone's flight.
3. Pilot – required for commercial drone flights and pilot must be licensed.

To help prepare workers for this growing industry FLOW programs could operate in the following manner:

- Students would be recruited from areas of California that have unfilled job openings. They would be accepted into the program based on common criteria that would initially require a GED or high school diploma, but could evolve based on evidence as the program matures.
- Learning materials would be prepared for all the job levels outlined above. For each level there are online components (many are open educational resources (OER) on government sites but are not designed for people with broad ranges of prior educational experiences). Successful completion of the educational activities for each level would result in a high-value certification that all build toward the highest level.
- The direct services to support students' learning would be bi-lingual. When students have questions about the program, their own requirements and funding options, tutoring, coaching, and job placement they could choose English or Spanish.
- Hands on demonstrations and practice would start on simulators near potential job sites. Assessments would include proctored online tools and face-to-face demonstrations of skills and knowledge that mimic the worksite.

All online learning materials would be designed to be accessible on smart phones. Direct student support would be primarily by phone conversations, which has been successfully used by large scale educational institutions with a wide variety of students. At the initial levels the learning materials would be available in both Spanish and English (learning materials would be offered in additional languages as the program matures). As learning materials progress through the certification levels they would be increasingly migrated toward English as the ultimate pilot's license assessments are only in English.

The designers of the learning materials will include teams of instructional designers, employers, evaluation specialists, and college faculty members. Each 'course' must be mapped to the real workforce requirements as well as elements of transferable credits so that if a student chooses he or she would stack those to achieve an associate degree he or she may do so.

In the FLOW program, students could start any time (not based on the usual college term system) and have access to learning materials and assessments anytime they are ready to study. Even though students will need to progress at their own pace, they would need to make a targeted rate of progress to remain in the program. The price of participation would be set into a subscription model; whereby all costs to the student are bundled within it. To encourage acceleration, the student would

pay a fixed price every two or so months regardless of how much of the coursework they can master.

When the student is ready to take another step in his or her career path, it would be time to enroll in a degree program offered at one of California's community colleges.

Other Considerations

The faculty members on the FLOW workgroup and others who have sent comments through the public site or offered them to the Board of Regents have indicated they have concerns about the first three FLOW options. The phrase that emerged is "Staunch the FLOW." Some of those concerns seem to stem from a misunderstanding that full-time faculty were not explicitly discussed in early drafts of the options. Some faculty interpreted the general framework as excluding the usual faculty roles in curriculum development. Thanks to the input from workgroup members the earlier drafts have changed. That is the purpose of an ideation group. The fourth option added more recently does seem to be more popular among college faculty members.

Another concern seems to be that the FLOW project might somehow undermine the on-going Online Education Initiative (OEI) efforts. The leadership of OEI has indicated that FLOW and OEI would be complimentary. The structure and activities of the OEI are not such that OEI could accomplish the directives given for FLOW in its current configuration. The OEI current structure could dovetail with the first three FLOW options to reach the objectives to enable educational services to reach a new population of Californians. The fourth option would shift the current structure and mission of the OEI to include FLOW assumptions.

A concern raised by some faculty and one president relates to a specific recommendation by the U.S. Department of Education's Office of Inspector General the suggested the competency-based education (CBE) model used by Western Governors University should be considered correspondence education. There does not seem to be support for that perspective in the Department, the Congress, the professional licensing organizations, nor the regional accrediting association that recognize WGU. That recommendation says nothing about the other dozens of CBE programs in operation around the country that have gained both the approval of their regional accrediting associations and the Department of Education. There are real advantages of a CBE model for adult workers as several colleges across the country have demonstrated over the last five years. In addition, employers are enthusiastic about graduates from CBE programs.

Some college presidents and faculty members have expressed concern that a FLOW initiative will draw students away from the existing community colleges when enrollments are already dropping. As this report indicates, there is a large number of working adults in California community college service districts who could be served more effectively. The fourth FLOW option recognizes that many community colleges in the state have online programs that offer somewhat flexible schedules and could utilize new practices to reach the adult workers. It is important to note that the people for whom FLOW is being designed are not currently being served by the existing colleges. It is designed to attract a new group of Californians into post-secondary education. Some of the individuals may well use their FLOW experience to enter more traditional associate degree programs. The college presidents who have been interviewed seem to understand the strategic shift that FLOW represents for underserved populations in the state.

The FLOW initiative has the potential to provide a model to other states regarding how to take steps to solve one of the largest issues facing the whole country. The options outlined in this report start with the needs of populations not being served by our traditional higher education systems, and

then utilize the people and structures in those systems to enhance opportunities for greater inclusion in the workforce.

---

[i] Mobile Up! Presentation by Alison Ascher Webber, Director of Strategic Initiatives, EdTech Center at World Education

[ii] Cell-Ed Report: Learning without Teachers? Evidence from a Randomized Experiment of a Mobile Phone-Based Adult Education Program in Los Angeles

- Unlike many other technology-enhanced education programs, the Cell-Ed learning curriculum was completely provided via a series of voice and SMS-based operations on the mobile phone (no internet required), and therefore did not require teacher instruction or in-situ learning.
- The platform uses voice (audio) and SMS messages to deliver 437 adult education lessons (called "micro-modules") to learners. Each micro-module consists of three components: 1) audio instruction: an audio lesson on a particular concept (vowels, consonants, words), and varying from 1-3 minutes in length, is introduced when the learner calls a designated number; 2) written instruction: a SMS message reinforcing the voice lesson is sent to the participant; and 3) interactive quiz: a SMS question is sent to the participant asking them about the lesson that they recently learned, and the participant must text a response. A correct response to the question triggers the beginning of the next micro-module, whereas an incorrect response leads to a repetition of the same micro-module until the user succeeds. To activate the program and each micro-module, participants call the Cell-Ed phone number from their own mobile phone. Students could access the program 24 hours a day, seven days a week, allowing them to learn when, where and how they wished.
- Seventy Spanish-speaking adult students were randomly assigned to the treatment (Cell-Ed) or control group, with the control group phased into the program after a three-month period.
- Found that students' reading scores are substantially increased over a four-month period, equivalent to a 2-4 year increase in reading levels. These results are robust to correcting for non-random attrition using a variety of non-parametric methods. The program also increased participants' self-esteem by 7% (used the Rosenberg Self-Esteem Scale and the General Self-Efficacy Scale). Researchers posit that these increases may be due in part to the flexibility of the curriculum, as learners opted to learn at all times of the day and for short durations, in stark contrast to the fixed schedules of many adult education programs.

"Admittedly, our experimental set-up has several limitations. First, we are unable to compare learning via the Cell-Ed platform with learning in a traditional adult education program, or the interaction between the two. As a result, we are unable to conclude whether such programs are complements or substitutes for teachers and in-classroom learning. Second, our small sample size greatly limits the external validity of our results. Nevertheless, our results show that a distance learning program via a simple mobile phone significantly improved adults' learning outcomes in this context, and suggests that there is great scale and scope for using these technologies in education programs in both developed and developing countries."

[iii] www.ConnectingCredentials.org Report released on November 1, 2017

[iv] Compiled by Kate Smith, Vice President of Academic Affairs at Rio Salado College

[v] Public Policy Institute of California report "Successful Online Courses in California's Community Colleges". Link: http://www.ppic.org/content/pubs/report/R_615HJR.pdf

[vi] www.qacommons.org