Information & Computing Technology
CENTER of EXCELLENCE

TECH PROGRAMS FOR THE WORKING LEARNER

OPPORTUNITIES FOR WASHINGTON'S COMMUNITY AND TECHNICAL COLLEGES

FEBRUARY 2022

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This material is based upon work supported by the Center of Excellence for Information & Computing Technology. The conclusions and recommendations are those of the author and do not necessarily reflect the views of the Center, its employees or its administration.

OVERVIEW

Community and technical colleges face multiple enrollment challenges arising from the COVID-19 pandemic. Due to a variety of intertwined trends shaped by and continuing to emerge from the pandemic, enrollments have declined significantly and are unlikely to recover unless new training approaches are successfully adopted and implemented. This is particularly true for working learners interested in technology careers. Companies across industries are changing their hiring practices to focus on skills-based hiring versus degree-based hiring. Leading tech firms such as Microsoft, Amazon and Google are sponsoring and in some cases creating their own tech training certification programs. Tech companies are also forming new partnerships with educational providers focused on nondegree short-term training programs to develop verifiable skillsets. What role can community and technical colleges play in this educational revolution?

One opportunity for colleges is to expand noncredit tech training certification programs to address enrollment and revenue challenges while providing increased access to working learners seeking new opportunities in tech careers. Why focus on working learners for tech opportunities and what is the best way to attract and train working learners?

The choice of the term "working learner" in lieu of "student" is intentional. Working adults who are simultaneously going to school to earn a credential have gained increasing academic attention in recent years, made only more critical in light of the COVID-19 pandemic. Instead of referring to these people as "students", working learners pursue paid employment and learning opportunities to advance their careers. As one educational researcher noted, "What I like about the term *working learners* is that it gives equal emphasis to the fact that people are constantly developing new skills and that they're also doing that either alongside paid employment or in the workplace, on the job."

Working learners may be especially attracted to new, innovative and affordable nondegree training options in well-paying tech careers.

Increasingly, educational leaders are adopting new strategies to better serve these students and ensure they have access to high quality educational programs, both credit *and* noncredit. Working learners – often with prior experience, educational qualifications and – perhaps most importantly – soft skills learned in previous jobs that tech hiring managers desire such as proven collaboration, leadership and project management skills – are a prime target population for community and technical colleges to increase enrollments and develop new educational pathways.

"What I like about the term working learners *is that it gives equal emphasis to the fact that people are constantly developing new skills and that they're also doing that either alongside paid employment or in the workplace, on the job." - Mitchell Steven, Stanford Graduate School of Education*

Tech Demand Growing

Credit bearing workforce and academic programs are essential for higher skilled tech workers seeking long term career placement and advancement. Entry level tech workers, however, are seeking relatively quick, inexpensive noncredit industry credentialed training programs leading to tech skill certifications in demand. Educators and employers are converging on skill-based training and employment for working learners who have gained skills through alternative routes rather than through two- and four-year degrees, including community college, workforce training

bootcamps, certificate programs, military service, and on the job learning. Short-term noncredit tech credentials can serve as a launchpad to gain employment and provide the working learner with pathways to seek training in traditional associate and bachelor degree programs in demand.

Increasingly, companies are finding that traditional hiring methods emphasizing degree attainment, among other requirements, is not attracting the talent needed to operate successfully. Employers are in the midst of a radical redesign of hiring skilled talent in the face of increased demand due to the Great Resignation and the sheer number of job openings and lower unemployment rate.

Colleges can play a critical role in helping their local employers find the "hidden workers" and equipping them with the skills needed to succeed.

To address immediate employer demand for skilled workers, employers and working learners are turning to skills-based hiring opportunities, i.e., proven experience and credentials rather than focusing on degree attainment. In spite of millions of unemployed and underemployed looking for work, businesses are struggling to hire and fill critical skill gaps. These so-called "hidden workers" are working part-time or are unemployed, either voluntarily or involuntarily.

Hiring managers are focusing on proven skills and community and technical colleges are positioned to offer programming that aligns with that approach. Colleges can play a pivotal role in helping their local workforce find this untapped talent by providing appropriate tech training programs emphasizing nondegree, short term training options that lead directly to well-paying tech jobs.

Occupational demand remains strong

Demand for qualified tech workers is particularly strong in Washington state, not only at tech firms like Google, Microsoft and Amazon, but throughout the economy, including finance, real estate, insurance, retail, healthcare, and manufacturing. Wages in computer occupations (SOC 15-1200) in Washington range from $68,700 on average for entry level workers to a high of $180,500 for experienced workers. A snapshot of Washington state tech job openings for midlevel jobs (Table 1) demonstrates a strong business case to be made at community and technical colleges for providing working learners the access and opportunity to pursue tech careers. During the one year period from January 2021 to January 2022 employers posted more than 16,000 job openings, including 4,400 jobs detailing required certifications for midlevel jobs in Washington (those requiring two-year degrees, long-term certificate programs of one year or more, or apprenticeships).

The job postings reflect statewide employer demand ranging from top tech employers like Microsoft and Amazon to advanced manufacturers like Boeing, as well as large employers such as University of Washington, Providence Health & Services, Blue Origin, and Starbucks. Many smaller companies are also increasingly turning to qualified tech workers as their business operations increasingly rely on remote and online service and product delivery in light of the pandemic and competition.

Table 1. Snapshot of Midlevel Washington State Tech Job Openings

SOC	Occupation	Active Job Ads
15-1244.00	Network and Computer Systems Administrators	7,940
15-1212.00	Information Security Analysts	4,097
15-1211.00	Computer Systems Analysts	2,236
15-1254.00	Web Developers	1,468
15-1242.00	Database Administrators	555
TOTAL		**16,296**
Certificate Name		**Active Job Ads**
Certified Information Systems Security Professional (CISSP)		876
Secret Clearance		462
Cisco Certified Network Associate (CCNA)		409
Certified Information Security Manager (CISM)		346
Certified Information Systems Auditor (CISA)		325
Microsoft Certified Solutions Expert (MCSE)		283
Cisco Certified Network Professional (CCNP)		249
Certified Ethical Hacker (C/EH)		206
Cisco Certified Internetwork Expert (CCIE)		129
Microsoft Certified Solutions Associate (MCSA)		128
Offensive Security Certified Professional (OSCP)		118
Project Management Professional (PMP)		117
GIAC Certified Incident Handler (GCIH)		114
Certified Cloud Security Professional (CCSP)		95
Certification in Risk and Information Systems Control (CRISC)		90
GIAC Security Essentials Certification (GSEC)		88
CompTIA Security+ CE (Continuing Education) Certification		84
Vmware Certified Professional (VCP)		56
GIAC Certified Intrusion Analyst (GCIA)		55
Network+ Certification		55
Microsoft Certified Professional (MCP)		48
CompTIA Advanced Security Practitioner (CASP)		47
GIAC Certified Forensics Analyst (GCFA)		46
Systems Security Certified Practitioner (SSCP)		42
TOTAL		**4,718**

Source: JobsEQ®
Data reflect online job postings that were active from 1/18/2021 to 1/18/2022.
Note: As defined by the Washington State Student Achievement Council, Midlevel jobs include those for workers who have completed two-year degrees, long-term certificate programs of one year or more, or apprenticeships.

It's a Brand New World Out There for Tech Training Opportunities

In addition to community and technical college tech degree programs and noncredit credentialing opportunities, working learners have an increasing array of options to pursue workforce certifications through online and hybrid programs. These programs provide working learners an opportunity to quickly skill up in a chosen tech career and earn competitive salaries with additional training and certification. As just one example, there is a plethora of tech bootcamps, both profit and nonprofit, aiming to attract top talent into tech positions and companies.

In an era of declining enrollments, colleges must forcefully respond to increasing competitive pressures to serve working learners with innovative, short term, noncredit programs.

Expanding training options outside the traditional degree pathways will likely put additional strain on targeted enrollment goals and funding unless colleges adapt to the rising competitive pressures for student learners from coding bootcamps, Education as a Service (EaaS) providers, industry sponsored initiatives, and apprenticeships and internships.

Coding Bootcamps

Coding bootcamps are alternative education schools providing online, in-person, or a combination of both that usually are a shorter duration in length than a typical college or university certificate or degree program. Their claimed advantage is that they can lead to faster and less expensive educational attainment of tech workforce credentials with lower tuition costs, shorter class times, and a workforce-oriented learning curriculum. Programs often provide no cost, low cost and tuition assistance and scholarships. Corporate and continuing education programs may be best equipped to partner directly with boot camp providers for specific certifications.

Bootcamp program examples include:

ada developers academy – a non-profit, tuition-free coding school for women and gender diverse adults combining classroom training and a paid, learning internship aimed at coding and software development.

Code Fellows – Seattle's first code school. Courses are provided in software development and ops and cybersecurity.

Coding Dojo - offers three full-stack coding bootcamps, full-stack part-time programs, as well as courses on data science and other emerging technologies. Tuition varies by location and program type.

Flatiron School – an accelerated adult-education tech school that teaches the skills needed to become a software engineer, data scientist, cybersecurity analyst, or cybersecurity engineer. The tuition for their courses varies by location and discipline.

Galvanize – Galvanize provides eight bootcamp campuses that include coworking, data science bootcamps, coding bootcamps, and corporate training. Tuition varies by program.

Generation USA – Free, online programs provide a rapid launch process, bootcamp-style training and placement, and individualized education plans with resources and support.

Google Career Certificates – free online Google courses in various certificates and in-demand skills, including Google data analytics, project management, UX design, IT support, IT automation with Python, cloud architecture, and data engineering.

SkillsBuild – a free digital platform providing technology and professional skills development. The program is designed to complement traditional college coursework.

University of Washington Coding Boot Camp – professional and continuing education program providing a variety of tech courses. Tuition varies by program. The UW boot camp is hosted by Trilogy Education Services, an EaaS provider (discussed below) that serves university tech programs.

Year Up - a national training program for urban young adults aged 18-24 with a high school diploma or equivalent. Operated by an organization of the same name, Year Up provides six months of full-time customized training in the IT and financial service sectors followed by six- month internships at major firms. The full-time program provides extensive supports— including weekly stipends—and puts a heavy emphasis on professional as well as technical skills.

Free coding courses may also be found online at YouTube, again, highlighting the competitive pressure for CTCs to provide the added value of faculty support, financial aid, and job search.

Education as a Service (EaaS) Providers

As shown in Table 2, EaaS providers like Promineo Tech, CompTIA, Unmudl and others provide tech training solutions, allowing the college to market the offerings under the college logo and website, and capture additional revenue. Several EaaS providers also provide student supports, including marketing support, enrollment management, faculty support, coaching, and financial assistance provided directly by the college. They may also assist colleges by hosting boot camps through the college continuing and corporate education website. Providers like Riipen provide work-based opportunities for students to demonstrate their skills.

Industry sponsored initiatives

In light of the high demand for skilled and certified tech employees, major tech companies are expanding their collaboration with community colleges, providing new and expanded opportunities for colleges to partner with tech companies. Given the ongoing demand industrywide, leading tech firms such as Amazon Web Services, Microsoft, Google, and others are partnering with online training providers like Coursera to offer free certification training programs. Demand for skilled workers is so great that companies will sponsor free training options for interested tech learners. Alternative tech education and training programs – including industry-driven certification programs, boot camps, and apprenticeship programs – are efforts to respond to demand that is simply not being met, especially for diverse and underserved populations.

Several tech companies have expanded or launched new partnerships to support community colleges and other higher education institutions, including Amazon Web Services, Salesforce, HubSpot, and Snap. This also includes new funding from Microsoft to support the NSF Advanced Technological Education National Cybersecurity Center at Whatcom Community College. The Center will provide cybersecurity training and education to faculty and support college program development.

Table 2. Education as a Service (EaaS) Programs

Name	Description	Tech Program Offerings	Cost	Additional Information
Comp TIA	The CompTIA Academic Partner Program provides tools and resources to help schools deploy turnkey curriculum including fundamental digital skills, IT and Cybersecurity. CompTIA Academic Partners leverage our learning resources, eLearning courseware and hands-on labs. CompTIA also provides skills validation through CompTIA's vendor-neutral certifications. In addition, we support instructors with continuous training and teaching best-practices through our connected global network.	Multiple – see course offerings	Varies	Community College of Spokane and Green River Community College are partnering on program delivery
Coursera	Coursera partners with more than 200 leading universities and companies to bring flexible, affordable, job-relevant online learning to individuals and organizations worldwide. We offer a **range of learning opportunities**—from hands-on projects and courses to job-ready certificates and degree programs.	Multiple - Computer science, data science, and information technology	Free access to Coursera for Campus Basic Plan	See, for example: Free Google UX Design Professional Certificate
Ed2Go	Serves adult education, career and corporate training markets. Provides colleges with online education programs. Affiliate Cengage Learning provides learning solutions to colleges and other education providers.	Data science, database management, programming	Depends on selected course or program of study	10 colleges participate in Washington
Generation USA	We transform education to employment systems to prepare, place, and support people into life-changing careers that would otherwise be inaccessible. We have a methodology that we believe can serve hundreds of thousands—and eventually millions—of people who are unemployed, underemployed, or need to learn new skills. Our program creates real business value for employers and lasting career impact for participants.	Free, online programs provide a rapid launch process, bootcamp-style training and placement, and individualized education plans with resources and support	Free to member institutions	South Seattle College offers a junior web developer program
Pathstream	Delivering high-demand digital skills programs through colleges and universities nationwide, and we streamline this education—creating a well-designed curriculum and learning platform that leads to compelling career opportunities for graduates.	Online certificate programs: Digital Marketing, Data Analytics, 3D immersive design, Salesforce administration, etc.	Varies by program and institution pricing	

Name	Description	Tech Program Offerings	Cost	Additional Information
Promineo Tech	Promineo Tech partners with community colleges to provide affordable, low-risk coding bootcamps through EaaS program offerings.	Front end software developer / Back end software developer	$2,900 - $3,900 per program	Central Washington University will be first to adopt in Washington
Riipen	Experiential learning platform designed to allow tech students to demonstrate their knowledge and gain practical experience to increase hiring prospects. Several thousand organizations of all sizes connect with post-secondary institutions to collaborate with learners on short-term projects and internships through work-based learning opportunities.	Multiple project-based learning opportunities, including marketing, business strategy, data, social media marketing, communications, data analysis, market research	No cost to participate in Center of Excellence pilot program starting Spring 2022	Contact the Center of Excellence for Information and Computing Technology for additional information.
Unmudl	Provide learners, particularly working learners, with multiple pathways to learning and employment, with clear signaling as to the time, cost, and uncertainty of each. Via our skills-to-jobs marketplace, every learner can get skills to go from skills-to-job with the shortest, most flexible, and affordable path possible.	Working learners have access to more than 260 noncredit courses that cover more than 40 subject and occupational areas	Varies by course	Bellevue College is a founding partner

Apprenticeships and Internships

Apprenticeships and internships come in a variety of flavors. Apprenticeships can be formally registered through the Washington State Apprenticeship & Training Council, or they can be non-registered apprenticeships customized to a specific industry or corporate sponsor. For instance, Bellevue College's Tombolo Institute is providing the related supplemental instruction (RSI) for registered application software developer, information security analyst, and IT system administrator apprenticeships sponsored by Activ, a group of software development and consulting companies seeking qualified candidates. The Washington Technology Industry Association also offers the Apprenti apprenticeship program. Apprenti screens applicants and successful applicants are sponsored by participating employers. Companies interview and select apprentices. Apprentices receive classroom training and transition to on-the-job training. The Apprenti program manages all compliance associated with registered apprenticeship and provides continued support to apprentices and employers.

Internships can similarly range from traditional corporate internships to micro-internships in which the student intern gains the necessary skills and training and then obtains professional experience at the sponsoring corporate site. Full internships can be packaged with the nondegree program offerings to add value to the direct instruction. Internships also provide an opportunity for developing professional skills such as working in teams, project management and leadership development.

Working learners have many choices; college, bootcamps, employer-provided training, apprenticeships and internships. Given these choices, the challenge and opportunity for CTCs is to determine local

demand, develop training and industry partnerships, and take advantage of available resources to successfully launch tech credentialing programs.

Community & Technical College Opportunities

Entry level working learners in tech careers have an increasing array of programs offering certificates and other noncredit tech options to choose from. The programs are typically short in nature (usually several weeks or less), cost competitive – including free tuition or very low cost – and skill-based, with a strong emphasis on industry recognized credentials, badges recognizing specific skills, and certificates.

The most logical entry point for a college is to offer noncredit tech training programs through their existing corporate and continuing education departments. Corporate and continuing education programs play a unique role in offering noncredit tech training programs that prepare working learners for successful careers. One of the greatest strengths of the CTC system is a proven capability to provide interested working learners with navigation and financial supports to determine the best options available. With intentional collaboration across departments, these nondegree programs can also become an entry point into credit bearing programs at the college and with college partners.

The programs can be adopted directly off the shelf by partnering with EaaS providers (for instance, Promineo Tech), or in partnership where the college leverages faculty expertise in-house to develop and administer established certifications (for instance, CompTIA).

Additionally, colleges may desire to offer free or low cost training to create a pathway for low income and diverse students to get the necessary certifications required for employment, for instance, Generation USA, or through workforce development grants.

Corporate and continuing education departments may also be best suited within their respective college organizations to directly offer customized tech training solutions based on their ability to tap specific faculty with experience in high demand tech fields. They are also able to partner directly with companies.

Recommendations – Tech Education and Training Solutions

The overwhelming demand for skilled tech learners far exceeds the training available. Washington's community and technical colleges play a critical role in increasing diversity and access for those interested in getting into this high demand and well-paying field. Every company – especially during these times of increased online communication, employees working remotely from home, and increasing online product and service delivery requirements – is seeking top tech talent at the entry level. As one director of a technology education program stated when considering the increasing technology expertise companies need to operate successfully, "All companies are tech companies." Working learners who can demonstrate that they have earned the specific desired certifications and have the skills to succeed are and will most likely remain in high demand.

"All companies are tech companies." – Technology education program director

The colleges are well placed to help working learners make sense of the multitude of tech training programs available and to identify cost-effective training options. College leadership – especially those involved in corporate and continuing education program delivery – should consider the following in developing noncredit tech degree credentials and programs for working learners:

- Request regional labor market information detailing required skills, education, and certification for target jobs from the Center of Excellence for Information and Computing Technology.

- Convene faculty and local employers to identify specific targeted noncredit credentialing opportunities. Focus on major employers in your service area regardless of industry sector.

- Review potential bootcamps, EaaS providers, and industry and workforce grant opportunities to deliver tech learner certification programs.

- Consider specific corporate partnerships with Microsoft, Amazon and other tech companies – the Education Design Lab provides a guide to working with employers to embed related credentials and certifications into academic programs.

- Incorporate additional work-based learning opportunities into existing academic programs by joining the Center of Excellence's fall 2022 pilot program using Riipen's experiential learning platform.

- Identify specific workforce training grant opportunities – two good places to start are the National Cybersecurity Training and Education Center (NCyTE) at Whatcom Community College and Career Connect Washington.

- Convene discussions between corporate and continuing education staff with and academic program staff to map a credential to employment to degree program. In other words, lay out a pathway for students to gain short-term credentials with an eye toward longer term academic success in their chosen field.

- Identify other college partners. Consult with the SBCTC's Continuing Education Council membership and the Center of Excellence for Information and Computing Technology in considering new noncredit tech programs – multiple financial resources and opportunities for program development and expansion are available.

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