PARTNERSHIPS FOR A FUTURE-READY WORKFORCE

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ACCT is a non-profit educational organization of governing boards representing more than 6,500 elected and appointed trustees who govern over 1,100 community, technical, and junior colleges in the United States and beyond. These community professionals, business officials, public policy leaders, and leading citizens offer their time and talent to serve on the governing boards of this century's most innovative higher education institutions and make decisions that affect more than 13 million students annually. For more information about ACCT, visit **www.acct.org**.

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EXECUTIVE SUMMARY

Community colleges and businesses have a shared interest in preparing students and existing workers to be successful in their careers. Community colleges seek to educate and train individuals in their community to have the knowledge and skills for current jobs and long-term career opportunities. Employers seek employees with both job-specific skills and employability skills to meet their current and future business needs. Given these shared interests, community colleges and businesses have a clear opportunity to form close partnerships to shape postsecondary education and workforce training. In this report, we detail how community colleges and businesses can form strong partnerships; national trends in employer needs and postsecondary attainment; and policies and practices that form a continuum of education and job training. Furthermore, we highlight five examples of innovative postsecondary education and workforce development initiatives from South Carolina; Washington; Miami-Dade County, Florida; Maricopa County, Arizona; and Maryland. These examples highlight how community colleges and businesses can partner directly or through broader partnerships also involving K-12 school systems, four-year colleges and universities, state government agencies, and industry organizations.

Community College and Business Partnerships

Developing partnerships with businesses and industries are a cornerstone of the community college model. As drivers of local workforces, community colleges must work closely with area businesses to properly equip their students with the knowledge and skills needed for successful careers. Collaboration can include identifying 1) the capabilities of students and existing employees; 2) current job and career availability and the necessary skills; and 3) how to align individuals' skills and business needs through academic programs and work-based learning opportunities.

A criticism of the postsecondary education sector is that institutions are slow to respond to business needs and technological changes.[1] Working closely with businesses can help community colleges more quickly learn of business needs and keep program offerings up-to-date. Conversely, it is also important for businesses to learn of their local community college's capacity to offer new programs—such as funding or available faculty—and requirements based on legislation, regulation, and accreditation standards. Successful partnerships often rest on how well community colleges and employers understand each other's needs and challenges. Appointing a designated liaison with knowledge of both the postsecondary and business sectors can facilitate mutual understanding and collaboration towards shared goals.[2]

Trends in Employer Needs and Postsecondary Attainment

In today's labor market, employers are increasingly seeking a trained workforce with a postsecondary degree or credential. Employers also seek to meet new business needs resulting from increased digital technologies and automation in the work place. Recent research points to several national trends in employer demand, including:

- Most available jobs are middle-skill—meaning they require more than a high school diploma but less than a four-year degree.[3]
- The share of jobs that require high levels of digital skills has risen.[4]
- In the next decade, many occupations and job functions characterized by physical labor or routine tasks will be replaced by automation.[5]

To keep pace with the changing labor market, employees will need to pursue continual education and training, especially to learn technical skills required of increasingly digital occupations. Furthermore, employees will need to develop durable, employability skills—such as teamwork and time management abilities—to succeed in non-fully automated jobs of the future that depend on human interaction and critical thinking.[6] Results from national polls indicate that both employers and employees recognize the importance of lifelong learning to keep pace with changing technology; however, while most employers expect individuals to gain preparation through postsecondary education, about half of Americans believe that it is their employer's responsibility to provide the necessary education and training for their job and almost two-thirds expect their employers to pay for retraining.[7]

When community colleges and businesses work together, employer-based training and postsecondary education does not need to be an either-or decision for workforce development. Both sectors can work together to provide students with options to earn a postsecondary credential including formal degree programs, on-the-job training, or corporate upskilling. One target demographic for colleges and businesses is the 16% of Americans who currently have completed some college, but not earned a degree.[8] Many of these individuals may hold a non-degree credential, such as an occupational license or certificate.[9] However, many who fall in to this category are individuals who started college without completing—and thus may not have the skills needed for gainful employment and typically do not experience the economic gains of completing a degree or credential.

Beyond supporting degree attainment, community colleges and businesses have an imperative to ensure students are completing credentials aligned to the career goals that can lead to greater economic prosperity. While many community college students pursue certificates and degrees aligned with specific industries or occupations, a large portion of community college students pursue degrees in the liberal arts and humanities. Given research showing that liberal arts associate degrees have less labor market value than associate of science degrees,[10] community colleges must support these students with career and academic counseling and work-based learning opportunities to prepare for the job market.

Federal Policy Landscape and Impacts on Education and Training Programs

The federal policy context can shape the extent to which community colleges and businesses can develop and sustain education and training programs; the types of programs colleges and businesses can offer; and students' ability to participate. Currently, three hallmark pieces of federal legislation shape postsecondary education and career training:

1. **The Higher Education Act (HEA)** authorizes funding for grants to postsecondary institutions, such as for institutional development and student support services. HEA also authorizes financial aid for students in the form of grants, loans, and work-study compensation to cover the cost of attendance.

2. **The Workforce Innovation and Opportunity Act (WIOA)** authorizes funding for state training grants supporting adults, youth, and dislocated workers.

3. **The Carl D. Perkins Career and Technical Education Improvement Act (Perkins CTE)** authorizes funding for state grants to support career and technical education at both the secondary and postsecondary levels.

Notable trends shaping current programs and the future of workforce development, include:

- **Limited funding** has placed constraints on improving or expanding postsecondary education and career training opportunities. While federal investments in postsecondary education have increased over the past decade, increased federal funding has been offset by rapid state disinvestment since the Great Recession of 2008.[11] Following several decades of decreased funding for career training, cuts have continued to WIOA and Perkins CTE state grants that support programs for adults, youth, and dislocated workers.[12] Furthermore, a loss of dedicated funding for community college career training programs and workforce development partnerships has resulted from Congress opting not to extend funding for Trade Adjustment Assistance and Community College and Career Training Grants, and for Community-Based Jobs Training Grants.[13] One area of increased funding for work-based learning has been for apprenticeship programs; however, the relatively small amount of funding for apprenticeships is insufficient to compensate for overall cuts to career training programs.[14]

- **Program flexibility and innovation** can help community colleges better meet businesses' needs and the needs of participating students, such as by reducing program length; offering options for distance education; and implementing direct assessment models to better align work and academic competencies. However, to remain eligible for federal funding, colleges must adhere to standards set by legislation, regulations, and accreditors.[15] Critics of loosening standards warn that experimentation can open opportunities for non-traditional education providers to abuse the federal funding system.[16]

- **Addressing students' financial barriers** to postsecondary education and career training is a top priority for policy makers, community colleges, and businesses alike. While many low-income community college students benefit from Pell Grants to pay for tuition, most students have unmet financial need to cover the full cost of tuition, fees, and living expenses such as housing, food, and transportation.[17] Furthermore, currently, Pell Grants are not eligible to be used towards short-term, career-focused education and training programs; community colleges have advocated for the expansion of Pell eligibility to short-term programs to help more low-income students pursue their career goals.[18] Other financial assistance options for job-seekers, include WIOA funded individual training accounts (ITA); however ITA funding and requirements can vary by state and locale, and are not awarded based on students' financial need.[19]

Partnership Profiles

To better understand how community colleges and businesses are working together to help students gain the necessary education and training, ACCT interviewed education and workforce development stakeholders from across the country. Some of these partnerships involve direct collaboration between the community college and a local employer, while other partnerships involve an array of stakeholders including those from the K-12 school system, four-year colleges and universities, state government agencies, and industry organizations. The partnership profiles in this report highlight different models for collaboration, as well as different strategies for postsecondary and workforce alignment.

- **The South Carolina Technical College System** offers several apprenticeship programs in partnership with regional automotive industry partners, including BMW and Michelin. The South Carolina Technical College System is also expanding apprenticeships and workforce training to growing industries in the region, including digital advertising, banking, and health care. Employers can be closely involved in curriculum planning and developing both short- and long-term programs to support business needs and students' education and career goals.

- **Washington State Community and Technical Colleges** house 10 Centers of Excellence, which serve as liaisons between the postsecondary institutions and industry partners to develop a skilled and certified workforce. Our report profiles the Center of Excellence for Aerospace and Advanced Manufacturing's partnership with Boeing to offer paid internships for high school and community and technical college students. The state's 34 community and technical colleges each have autonomy over designing its programs and curriculums to meet local industry needs; however, too much variation from college to college can make it difficult for employers to find employees with a consistent skill set and knowledge base. Therefore, the Centers of Excellence have a critical role to facilitate the alignment of curriculum across the state and better ensure students are developing a common skill set.

- **Miami Dade College** (MDC) is known for its large undergraduate enrollments—the largest of any college or university in the country—and the institution's effort to serve a diverse student population. MDC also demonstrates a strong record of student success, based on graduate, transfer, and employment rates. Part of MDC's success has been a result of a commitment to serving its diverse community and preparing students for emerging industries in the Miami-Dade County area. The newly **established Miami Animation and Gaming International Complex (MAGIC)** is an example of MDC's efforts to prepare students for careers with hands-on training and opportunities to interact directly with local employers. The MAGIC program is in its infancy but has been growing rapidly with support from the program chairperson who leverages existing industry relationships, support from large employers including Univision and Disney, and students' interest to connect their academic coursework with hands-on job experience in a growing industry.

- **The Maricopa Community College District** contains 10 independently accredited colleges located in and around Phoenix, AZ. Our profile focuses on the district's partnerships with the local health care system. The district has robust healthcare training programs tailored for a variety of professions from entry-level allied health professions to multiple levels of nursing. Furthermore, many campuses offer concurrent enrollment opportunities with four-year universities and opportunities to earn stackable credentials as students move through academic programs and clinical experiences. Within the healthcare education program, Maricopa offers programs to meet the specific needs of its diverse student body and communities. For example, to support student veterans, Gateway Community College offers a 12-credit LPN bridge course designed for veterans with previous healthcare training.

- **Maryland's Pathways in Technology Early College High School** (P-TECH) program is a model for early college access with an emphasis on career preparation. Across the state, Maryland places a strong emphasis on providing students with opportunities for early college access, such as through dual enrollment or early college high schools. Specifically, the P-TECH program spans from high school through two years of postsecondary education towards the completion of an associate degree at no cost to students or their families. Employer partnerships are critical to the model to help students gain the education and skills needed for successful careers. P-TECH benefits from statewide policy to provide direct funding and considerable buy-in from educators and employers to grow the program.

To prepare students for successful careers in today's job market and the future, it is essential for community colleges and businesses to work collaboratively. We hope the research and strategies described in this report will help community colleges and businesses support access to postsecondary education, degree completion, and alignment with businesses needs even as the nature of work changes over time. Ultimately, a partnership between community colleges and businesses can help students and existing workers be successful in their careers and achieve greater economic prosperity.

INTRODUCTION

Community colleges and businesses have a shared interest in preparing students and existing workers to be successful in their careers. Community colleges seek to educate and train individuals in their community to have the knowledge and skills for current jobs and long-term career opportunities. Employers seek employees with both job-specific skills and employability skills to meet their current and future business needs. Given these shared interests, community colleges and businesses have a clear opportunity to form close partnerships to shape postsecondary education and workforce training. Through a review of recent research, data analysis, and interviews with community college leaders, this paper takes a close look at these trends and how community colleges can work with businesses to prepare students for successful careers in a shifting economy.

The first section of this report begins with context around the need for community college and business sector partnerships, changes to work and employer needs, and national postsecondary attainment trends. We continue by identifying strategies to connect postsecondary education with the workforce and help students and existing employees develop skills throughout their careers. Furthermore, we provide a primer on the current federal policy landscape shaping workforce development.

The second section of this report includes five profiles of exemplar community college and business sector partnerships across the country: the South Carolina Technical College System, Washington State Community and Technical Colleges, the Miami Animation and Gaming International Complex (MAGIC) program at Miami Dade College, and Maryland's Pathways in Technology Early College High (P-TECH) program. These colleges and programs were chosen for their use of partnerships between the education and business sectors, as well as for their efforts to prepare students for changing workforce needs. The profiles also highlight the best practices employed by these partnerships to ensure students are continually developing their skills to meet business needs over time.

ESTABLISHING STRONG COMMUNITY COLLEGE AND BUSINESS PARTNERSHIPS

Developing partnerships with businesses and industries is a cornerstone of the community college model. As drivers of local workforces, community colleges must work closely with area businesses to properly equip their students with the knowledge and skills needed for successful careers. Community colleges hold a unique position given their connections to local employers, and other arms of the education sector including K-12 systems and four-year institutions. As such, community colleges are an integral component of ensuring that students have a clear pathway from education to career.

Through concerted partnerships, community colleges and businesses can gain a better understanding of the steps required to prepare the workforce with the skills needed for in-demand and growing occupations. Collaboration can include identifying: 1) the capabilities of students and existing employees; 2) current job and career availability and the necessary skills; and 3) how to align individuals' skills and business needs through academic programs and work-based learning opportunities. A criticism of the postsecondary education sector is that institutions are slow to respond to business needs and technological changes.[20] Working closely with businesses can help community colleges more quickly learn of business needs and keep program offerings up-to-date. Conversely, it is also important for businesses to learn of their local community college's capacity to offer new programs—such as funding or available faculty—and requirements based on legislation, regulation, and accreditation standards.

Partnerships can take several forms. Community colleges may work directly with one local employer or collaborate more broadly with an industry sector. Often, community colleges and businesses collaborate through advisory boards that include additional partners such as representatives from the K-12 system, government, workforce development boards, chambers of commerce, and non-profit organizations. The goals of these advisory boards can range from strategic planning for education and workforce alignment to curriculum planning for a specific workforce development program. Later in this report, we provide more details about different education and career pathway models, such as early college high schools, internships, and apprenticeships.

While partnerships can take on several forms and objectives, previous research reports and field guides provide best practices for how the education and business sector can work effectively together to support education and career pathways. Overlapping best practices from the literature include:

- Developing shared goals and means for accountability;
- Recognizing local/ regional needs and challenges;
- Addressing students' academic and social needs;
- Engaging interested stakeholders and identifying a strong leader;
- Having a plan for partnership sustainability; and
- Holding regular partner meetings and establishing open lines of communication.[21]

Partnerships can hinge on how well community colleges and employers understand each other's needs and challenges. In their report, *Connecting Community Colleges with Employers*, researchers from the Brookings Institution detail how a designated liaison or "navigator" can support collaboration. The report authors layout key functions of the liaison including:

Helping industry partners understand the college environment and vice-versa;

- Identifying shared norms and goals;
- Developing knowledge of industry-specific labor needs.[22]

Brookings researchers emphasize how the liaison must be someone skilled in relationship building and who is able to work closely with leaders from both the education and business sectors. It may also be helpful for the liaison to have previously worked in the partner industry in order to have a keen sense of needed skills for employment and a network of contacts with whom to develop work-based learning opportunities.

CHANGES TO WORK AND EMPLOYER NEEDS

In today's labor market, employers are increasingly seeking a trained workforce with a postsecondary degree or credential. Coupled with technological changes, this trend is creating a greater need for individuals to have both strong technical skills and soft skills in to be successful in today's labor market. Given rapid technological change, the nature of work is also characterized by uncertainty about the skills needed for jobs in the future. This section examines the literature and data on employer's demand for postsecondary credentials, changes resulting from new digital technologies and automation, and employer-based workforce training.

Employer Demand for Postsecondary Credentials and Digital Skills

Earning a postsecondary credential is increasingly important for securing a job in today's labor market. An often-cited prediction from Georgetown's Center on Education and Workforce (CEW) states that by the year 2020, 60% of all jobs in the United States will require a postsecondary credential.[23] Many Americans and their employers often think of traditional postsecondary education as programs leading to a four-year bachelor's degree; however, many of today's jobs require education and training at the sub-baccalaureate level. According to researchers from the National Skills Coalition (NSC), over 50% of all jobs in 2015 were middle-skill—meaning they require more than a high school diploma but less than a bachelor's degree. Combined, middle- and high-skill jobs made up 84% of all jobs. Furthermore, NSC predicts that this trend will persist through 2024.[24]

In the decade following the Great Recession of 2008, there has been a significant shift away from blue-collar occupations to white-collar work. These new white-collar jobs often require at least some postsecondary education or training. According to CEW researchers, 83% of blue-collar jobs only requiring a high school degree or less have been lost or replaced since the recession. Many of these lost jobs were in industries characterized by physical labor or factory work, such as manufacturing, and have since been replaced by white-collar jobs requiring at least some postsecondary education in industries such as health care and financial services.[25]

The post-recession shift from blue-collar to white-collar employment is partly a result of technological change towards digital-based work. According to recent analysis by researchers from the Brookings Institution, from 2002 to 2016 the share of occupations that require a high level of digital skills—such as software developers and finance managers—increased from approximately 5% to 23%. In contrast, the share of jobs that require a low level of digital skills—such as construction workers and personal-care aides--decreased from approximately 56% to 30%.[26] These data suggest that as available jobs become more dependent on digital technologies, employees will need to learn new skills to keep pace with changing labor market needs.

Potential Impacts of Automation and Artificial Intelligence

Many researchers speculate that new technologies and automation—especially related to artificial intelligence (AI)—could drastically change the landscape of growing occupations, available jobs, and necessary skills for employees. Researchers' estimates of job loss due to automation vary dramatically, ranging from about 10% to 50% of workers being displaced; however, most agree that automation will have at least some impact on the nature of work in the near future.[27] For example, analysts from the accounting and consulting firm Pricewaterhouse Coopers (PwC) estimate that 38% of U.S. jobs could be at risk of full or partial automation by the 2030s. Similarly, researchers from the McKinsey Global Institute (MGI) estimate that by 2030, 23% of work hours may become automated. According to MGI, the impact of automation will be a combination of a decline in some industries and growth in others; people opting to change occupations; jobs lost; and jobs created in new industries and occupations that may not yet exist in the current labor market.

Though predictions for the scale of automation vary, researchers agree that the industries and jobs most susceptible to automation are characterized by physical labor and routine tasks. Jobs and industries predicted to be more durable are those characterized human interaction and specialized expertise. As a result, students and existing employees will need to develop a strong set of employability skills, such as effective communication, team work abilities, and organization.[28]

Workforce Training in the Age of Automation

As part of its 2016 automation report, former President Barack Obama's administration recommended investing in postsecondary education and training as a key strategy to ensure that automation leads to economic prosperity rather than decline.[29] In order to keep pace with the changing labor market, employees will need to pursue continual education and training, especially to learn technical skills required of increasingly digital occupations. Furthermore, employees will need to develop durable, employability skills—such as teamwork and time management abilities—to succeed in non-fully automated jobs of the future that depend on human interaction and critical thinking.[30]

Because the future of work and technology is difficult to predict, preparing workers for the realities of a rapidly changing labor market is essential. According to a 2017 survey from Northeastern University and Gallup, Americans have mixed feelings about how AI will impact the economy and jobs. While 73% of those surveyed think AI will lead to an overall loss of jobs, only 23% fear losing their own. Anxiety about overall job loss is highest among workers in the manufacturing-related (90%) and clerical (83%) fields. Even with the understanding that changes to the work environment are coming, just over half of Americans agree that they would need additional training or education should they lose their job to new technology. Though for those who would seek to learn new skills, about half believe that it is their employer's responsibility to provide the necessary training and education; almost two-thirds expect their employers to pay for retraining.[31]

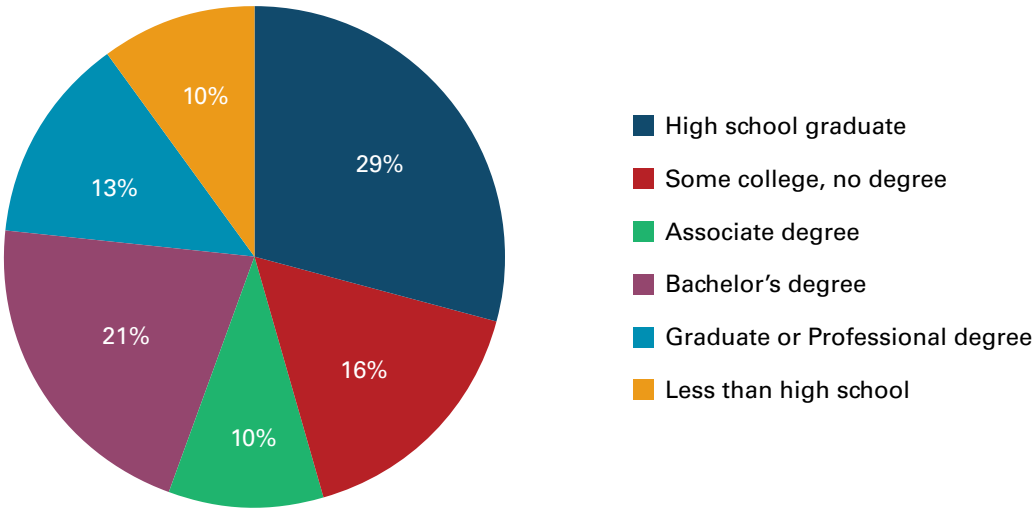
According to CEW researchers, as of 2015, employers spend over $400 billion per year for on-the-job training and $60 billion per year for formal training—just under half of the $1.1 trillion total spent each year on postsecondary training by employers, government agencies, and postsecondary institutions combined.[32] For employers that do invest in employee training, the investment typically pays off. For example, according to a study by Lumina Foundation examining the benefits of Discover Financial Services' Tuition Reimbursement Program, the company experienced a 144% return on investment (ROI) and saved nearly $11 million from 2010 to 2013. Savings were the result of higher retention rates and lower absenteeism. Participating employees also benefitted from annual pay increases 41% greater than those who did not participate and more career opportunities, such as promotions.[33] Other recent examples of employer-sponsored training, include ATT&T's $1 billion Future Ready effort to retrain 100,000 employees in need of updated skills to manage new technology, by offering online courses in subjects including data science, cybersecurity, and project management.[34]

NATIONAL POSTSECONDARY ATTAINMENT AND ENROLLMENT TRENDS

Recent trends show that employers are increasingly seeking workers with at least some postsecondary education.[35] With technological change and increased automation, it is essential for community colleges and the business sector to work together to ensure that students and existing workers will be qualified for growing industries and occupations. However, in addition to technological change, community colleges and businesses must address challenges to student access and success in postsecondary education. The data in this section provides further detail about national levels of educational attainment, postsecondary enrollment, and students' persistence towards degree completion.

In today's economy, earning a postsecondary credential is critical for economic success and many individuals begin to see returns on their investment once they earn a career-related certificate or an associate degree.[36] According to data from the United States Census Bureau, in 2017, approximately 44% of Americans had earned at least an associate degree or higher. For individuals who fall in to the "some college, no degree" category, their outlook for securing gainful employment is less clear.[37] Many of these individuals may hold a non-degree credential, such as an occupational license or certificate.[38] However, many who fall in to this category are individuals who started college without completing—and thus may not have the skills needed for gainful employment and typically do not experience the economic gains of completing a degree or credential.

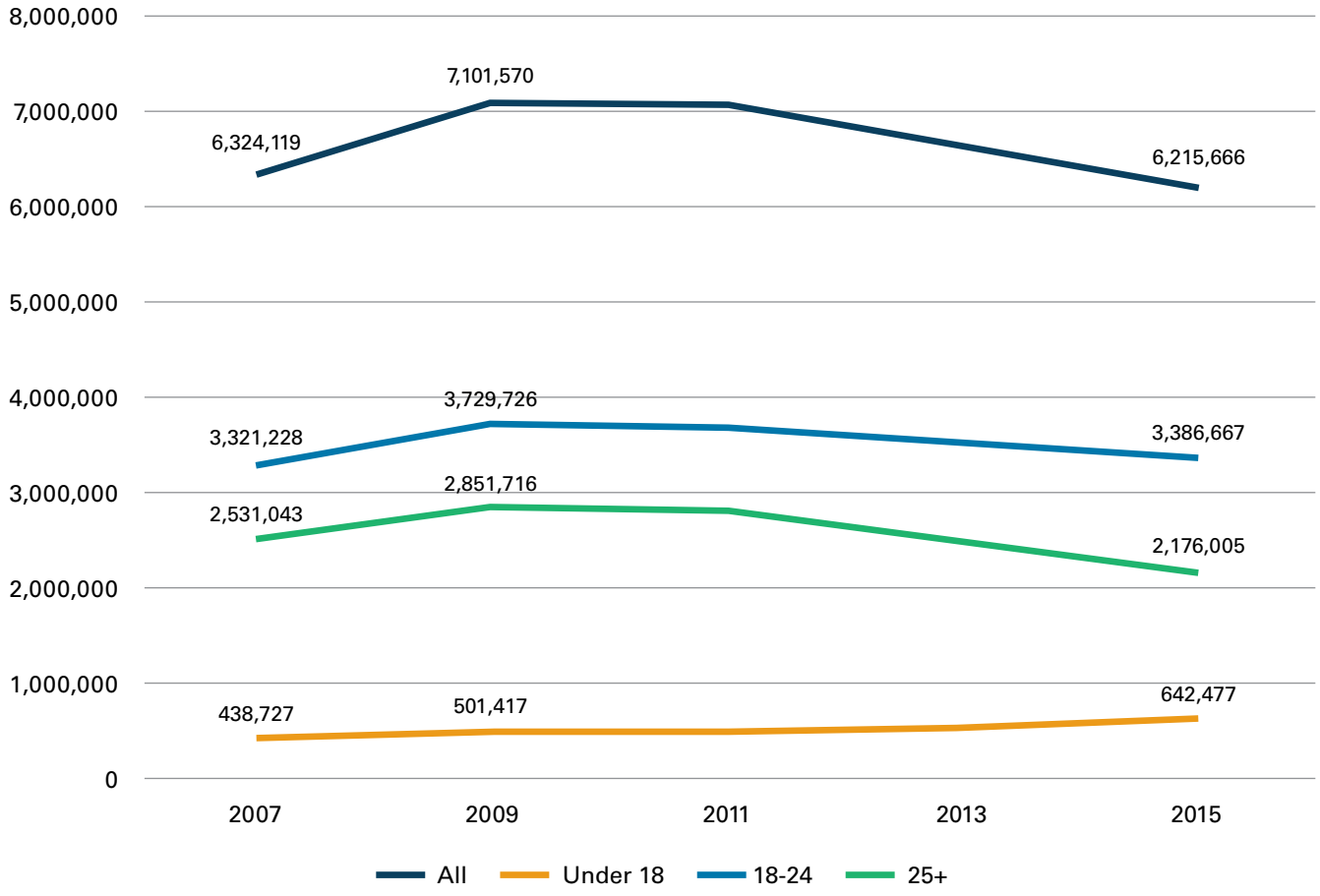
HIGHEST LEVEL OF EDUCATIONAL ATTAINMENT UNITED STATES POPULATION 25 YEARS AND OVER, 2017



Source: United States Census Bureau. Current Population Survey, 2017. Annual Social and Economic Supplement: Educational Attainment of the Population

Helping more Americans earn a postsecondary credential hinges on both their enrollment in postsecondary education and persistence towards degree completion. Data from the United States Department of Education, National Center for Education Statistics shows that overall community college enrollment has been in decline following the Great Recession of 2008. The one area of increase has been among students under the age of 18—presumably the majority of whom are enrolled through an early college access program, such as dual enrollment. While a decline in enrollments is to be expected following a recession—given students' cost benefit of enrolling in postsecondary education versus entering the labor market—this is a concerning trend given employers' continued preference for workers with at least some postsecondary education.

FALL ENROLLMENT AT TWO-YEAR PUBLIC INSTITUTIONS BY STUDENTS' AGE



Source: United States Department of Education, National Center for Education Statistics, Integrated Postsecondary Education System (IPEDS)

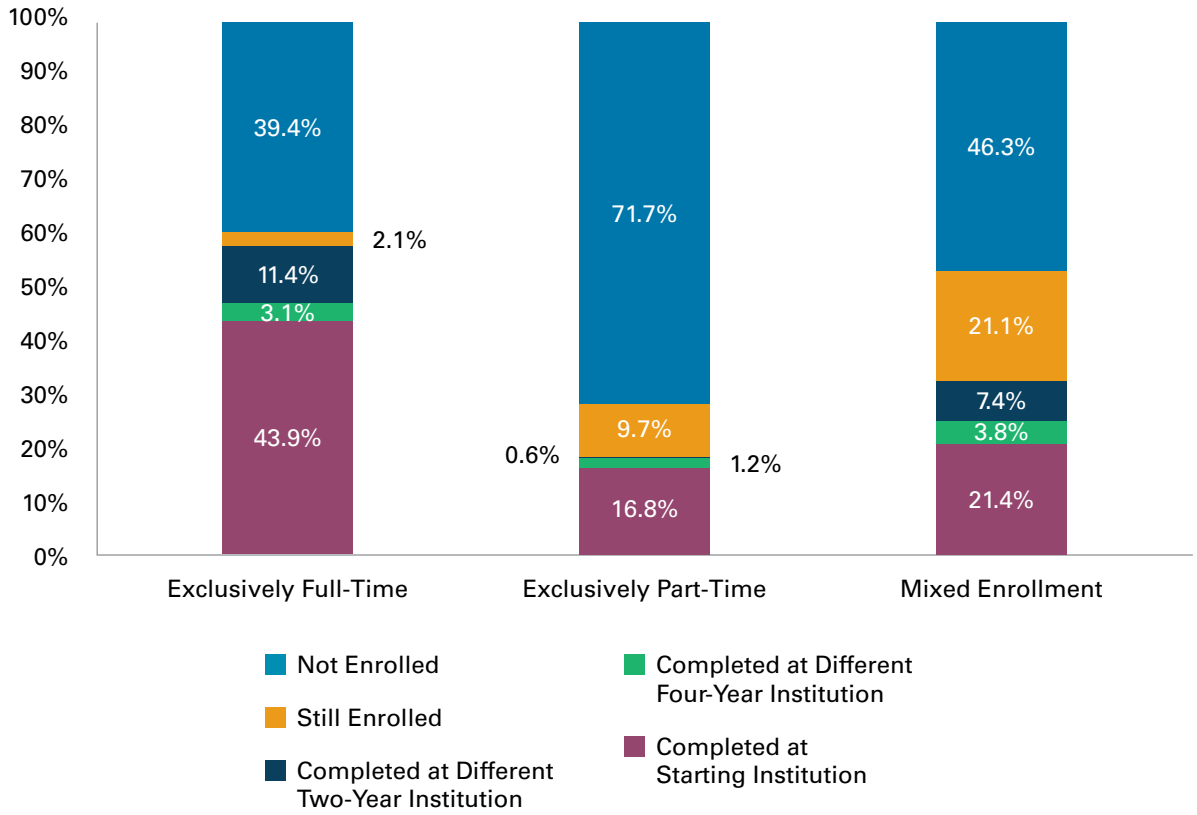
Among enrolled community college students, many seek certificate and degrees in health professions and business-related fields—both in-demand and growing industries.[39] While many community college students pursue certificates and degrees aligned with specific industries or occupations, a large portion of community college students pursue degrees in the liberal arts and humanities. Given research showing that liberal arts associate degrees have less labor market value than associate of science degrees, [40] community colleges have an added imperative to ensure these students are engaging in career and academic counseling and work-based learning opportunities.

TOP CERTIFICATE AND ASSOCIATE DEGREE PROGRAMS AMONG COMMUNITY COLLEGE STUDENTS

Source: United States Department of Education, National Center for Education Statistics, Integrated Postsecondary Education System (IPEDS), Fall 2015

Beyond supporting students to enroll in credential programs that align with their career goals, colleges must help students persist from semester to semester and support those who may have stopped out to re-enroll. According to data analysis by researchers from the National Student Clearinghouse, 38% of community college students complete a degree, either at their starting institution or a transfer institution, within six years of enrolling. Persistence and completion rates vary between different student populations. A stark difference is seen between students who attend full-time compared to those who attend part-time. Within six years of enrolling, 61% of full-time community college students had completed their degree or were still enrolled, compared to only 28% of part-time students.[41] Given that over 50% of community college students are enrolled part-time, significant opportunity exists to help these students complete their degrees and prepare for their careers, such as with targeted academic and career counseling and financial assistance to help them students balance their courses, work, and family responsibilities.[42]

PERSISTENCE AND DEGREE COMPLETION FOR STUDENTS WHO STARTED AT TWO-YEAR PUBLIC INSTITUTIONS BY ENROLLMENT INTENSITY



Source: National Student Clearinghouse, Completing College: A National View of Student Completion Rates Fall 2011 Cohort

FEDERAL POLICY LANDSCAPE

At the federal level, both education and labor policies shape how community colleges and businesses educate students and prepare the workforce. Major trends that shape the current federal policy environment include: changes to funding streams and levels of funding; creating policy levers for program flexibility and innovation; and addressing students' financial barriers to pursing postsecondary education and training. This section details each of these three themes. While the section focuses on federal policy, community college and business partnerships are also shaped by policies at the state and local levels. Various state and local initiatives are highlighted in the partnership profiles in the second section of this report.

Federal Funding

The federal policy context can shape the extent to which community colleges and businesses can develop and sustain education and training programs; the types of programs for which colleges and businesses can garner federal; and students' ability to participate. Currently, three hallmark pieces of federal legislation shape postsecondary education and career training:

4. **The Higher Education Act (HEA)** authorizes funding for grants to postsecondary institutions, such as for institutional development and student support services. HEA also authorizes financial aid for students in the form of grants, loans, and work-study compensation to cover the cost of attendance.

5. **The Workforce Innovation and Opportunity Act (WIOA)** authorizes funding for state training grants supporting adults, youth, and dislocated workers.

6. **The Carl D. Perkins Career and Technical Education Improvement Act (Perkins CTE)** authorizes funding for state grants to support career and technical education at both the secondary and postsecondary levels.

Over the past decade, community colleges have benefited from increased federal funding for postsecondary financial aid, student services, and institutional improvements. HEA funding increases important for community colleges include those for Pell Grants, Supplemental Educational Opportunity Grants, TRIO and GEAR UP programs, and aid for institutional development especially at minority-serving institutions.[43] While federal investments in postsecondary education have increased over the past decade, increases have been offset by rapid state disinvestment since the Great Recession of 2008. Negative impacts of funding cuts include the need for institutions to eliminate programs and to reduce faculty. Funding cuts have also resulted in increased tuition and fees at public two-year colleges, thus shifting more cost burden to students and their families and reducing the purchasing power of financial aid, such as Pell Grants.[44]

Further constraining community colleges has been the significant decline in federal funding for workforce training. Since 2009, state grants under WIOA and Perkins CTE have been cut by approximately 20%. Recent funding cuts are part of a larger trend of cuts to workforce training over the past several decades, impacting programs for adults, youth, and dislocated workers.[45] An additional decrease has come from the loss of dedicated federal funding to build capacity for career training at community colleges, and to develope partnerships between colleges, businesses, industry groups, and other government and nonprofit organizations.

The Trade Adjustment Assistance and Community College and Career Training Grants (TAACCCT), authorized in 2009 through the American Recovery and Reinvestment Act and funded through the Health Care and Education Reconciliation Act of 2010, was the latest iteration of dedicated funding for community college career training programs. The TAACCCT program was preceded by the Community-Based Jobs Training Grants (CBJT) program from 2005 to 2010. When the TAACCCT program was authorized, from 2011 to 2014 states received a total of $1.9 billion dollars to strengthen career training programs and business partnerships, particularly in growing industries such as health care, manufacturing, IT, energy, and transportation. [46] As of September 2017, over 320,000 credentials had been earned by students in TAACCCT funded programs, demonstrating the grant program's value. [47] However, following the last TAACCCT grant year, Congress opted not to provide additional funding for the program and opted not to renew the CBJT program during the 2014 WIOA reauthorization. [48] Without a dedicated source of federal funding, community colleges and businesses face limited capacity to expand and sustain these workforce development efforts.

At the federal level, both President Donald Trump and former President Barack Obama have called for increased investments in registered apprenticeships, especially by expanding across states and into new industries.[49] In July 2018, the Department of Labor (DOL) announced a new $150 million grant program to scale 15 to 30 new or existing apprenticeship programs, in particular those geared towards occupations that have not typically used this model.[50] While this will support a number postsecondary institutions and businesses who receive the grant, the relatively small amount of funding is insufficient to make up for overall cuts to workforce training. Lawmakers in Congress have introduced legislation to further expand funding for work-based learning, such as the Jumpstart Our Businesses By Supporting Students (JOBS) Act of 2017, which seeks to allow use of Pell Grants for short-term training programs including eligible apprenticeships.[51] Furthermore, state and local policymakers, with support from federal grants, are expanding apprenticeship opportunities as a strategy for workforce development.[52]

Program Flexibility and Innovation

To keep pace with the needs of students and businesses, many community colleges have sought to innovate their programs, such as by decreasing time to degree completion or providing options for online learnings. However, changes to program structures must adhere to legislation, regulations, and accreditation standards to remain eligible for federal funding.[53] Examples of program innovations shaped by these standards include:

- Credit-hour requirements and program length;
- Distance education; and
- Direct assessment, such as through competency-based education.

The Department of Education recently announced plans to review the current regulations that provide oversight of programs with these types of innovations.[54] Loosening regulation to allow for program innovation is not new to the current Department of Education under President Trump. Under former President Obama's administration, the Department of Education started several pilot programs to assess the efficacy of innovative models, such as competency-based education and the integration of online courses from non-accredited education providers.[55] However, critics of loosening regulations warn that experimentation can open opportunities for non-traditional education providers to abuse the federal funding system.[56]

To prevent fraud and abuse, abiding by the government's oversight and quality assurance measures often mean that colleges must take measured steps and work through iterative review processes to create new programs or change existing ones. A downside to this approach is that community colleges have less flexibility to offer credit-bearing programs to meet employers' immediate needs. Nonetheless, oversight is important to ensure students have access to quality programs and to limit abuse in the funding system from non-traditional educational providers.[57]

Student Financial Barriers

Policy and program design can also impact students' financial ability to pursue postsecondary education and workforce training. Community colleges are well known for their comparatively low tuition and for many low-income students, a full or partial federal Pell Grant is enough to cover the cost of community college tuition: $3,500 per year on average.[58] Despite low tuition, many community college students face affordability barriers. In 2016, the average Pell Grant award for recipients at community colleges (two-year public institutions) was approximately $3,300—a few hundred dollars less than the average price of tuition. Furthermore, nearly three-quarters of community college students have unmet financial need cover the full cost of tuition, fees, and living expenses such as housing, food, and transportation. [59] Recognizing students' financial barriers, many federal policy makers and advocates have called for strengthening Pell Grants and increasing need-based aid to cover the costs of living expenses.[60]

Beyond increases to Pell Grants and need-based aid, policy makers are considering extending Pell eligibility to short-term programs. Currently, for students to be eligible to receive a Pell Grant, they must be enrolled in a program that is at least 16 credit hours or 600 clock hours. However, many career-training programs are short-term and do not meet this threshold. In response, community colleges have advocated for the expansion of Pell Grant eligibility to short-term programs to help more low-income students pursue their career goals.[61] Critics of expanding Pell Grant eligibility to short-term programs raise concerns about ensuring program quality and ensuring that short-term programs have measurable benefits to help students reach their career goals.[62]

In addition to Pell Grants, job-seeking individuals may be eligible for financial assistance grants provided under WIOA. Job-seekers can receive an individual training account (ITA) voucher by going to an American Job Center (previously One-Stop Career Center) in their area to pursue job training through an eligible training provider, such as a community college. Grant awards and requirements for ITAs can vary by state and locale. Unlike Pell Grants, ITAs are not awarded based on students' financial need. Students who receive a Pell Grant or other financial aid may be eligible to supplement with an ITA to cover remaining tuition costs. Policy makers, community college leaders, and business leaders working at the state and local level should work strategically to ensure that WIOA funding is supporting partnership efforts and that students can easily access all financial resources for which they are eligible. [63]

POSTSECONDARY AND WORKFORCE-ALIGNMENT STRATEGIES

To meet the demands of employers and attempt to close the skills gap, community colleges are restructuring educational programs to better prepare students for employment and train the existing workforce. Institutions can meet this demand by offering several types of education experiences that simultaneously teach students liberal arts and practical workforce skills that can successfully help students become employed. In this section, we describe several postsecondary and workforce-alignment strategies to support students along their educational and career pathway.

Strengthen Links between K-12, Postsecondary Education, and the Workforce

Early College Access Programs

Career and technical education can align with K-12 curriculum by targeting students currently enrolled in high school or soon after they graduate. Many community colleges partner with local high schools to offer career academies and early college high schools (also known as middle colleges) which aim to provide students with career-specific training in tandem with their high school coursework and lower level postsecondary coursework.[64] Dual enrollment is another strategy to engage high school students early and create a more seamless pathway from secondary education to postsecondary education, and career. By enrolling in dual-enrollment courses, students can earn college credits that can be applied towards a postsecondary credential. Currently, dual-enrollment students are one of the fastest growing populations at community colleges.[65]

Work-based Learning

Work-based learning opportunities, such as internships and apprenticeships, have been gaining attention in the national dialogue about connecting postsecondary education to careers. In particular, the leaders in the community college and business sectors are looking to grow apprenticeship programs to train students for careers in growing white-collar industries, including the financial sector, information technology, and health care.[66] Nationally, expansion has been encouraged through the federal Registered Apprenticeship program. Pre-apprenticeships and youth apprenticeship provide additional opportunities for students to engage in work-based learning while still in high school and to further develop foundational math, literacy, and employability skills.[67] Many states also have their own coordinated apprenticeship programs, as well as incentives for community colleges and businesses to participate.[68]

Provide Opportunities for Continuous Learning

Stackable Credentials

Stackable credentials provide a step toward a higher-level certificate or associate degree in the same occupation or field of study. Researchers from the Community College Research Center have identified three common types of stackable credentials: 1) progressive stacks that start with a certificate and that lead to an associate or bachelor's degree, 2) supplemental stacks where a student earns a certificate after earning a degree, and 3) independent stacks of multiple certificates that do not necessarily sum to a degree.[69] Each type of stackable credentials can be beneficial to students, especially working students, by allowing for more flexibility to earn incremental certificates and degrees as options for "up-skilling" while moving between education and work. While research is still limited about which model yields the best educational and career outcomes, the added flexibility is useful for students and employers seeking options for continual learning.[70]

Sector Pathways

Sector pathways, also known as career pathways, provide students with industry-based training to more successfully transition from education to the workforce. Sector pathways enable students to receive coursework and work-based learning that provide engaging activities to prepare them for the workforce.[71] A sector pathway has several elements: rigorous, sequential, and clearly defined coursework; multiple entry and exit points; transitional support between pathway levels; career counseling; comprehensive support services; employer partnerships; and work-based learning and contextualized instructional strategies.

Upskilling for Existing Employees

In light of rapid technological change, many employers have recognized the need for workers to have access to lifelong continual learning opportunities. Continual education is a benefit for both employees who experience wage increases and career mobility, and for employers who save money from greater employee retention and productivity.[72] Upskilling programs, often in the form of customized corporately sponsored training, provide existing workers with training to develop new skills as the tasks and demands of their occupation change over time. Community colleges have an important role in upskilling by coordinating with local businesses to learn about business needs and translate them in to tailored programs for working adults who may not have direct access to employer-based training. Other types of upskilling can be geared towards employees at multiple stages of their careers, such as pre-employment training, tuition assistance, or hybrid models in partnership with a third-party provider.[73]

Recognize Skills from Previous Work and Learning

Prior Learning Assessments

Prior learning assessment (PLA) allows students to gain an academic credit from previous learning and work experiences—such as through the evaluation of work portfolios, resumes, and education mastery exam scores. These experiences can range from on-the-job training or military service to even volunteer experiences. When postsecondary institutions award credit for prior learning, students can save time and money by avoiding duplicative coursework needed to complete their degrees. According to the Council for Adult and Experiential Learning (CAEL), students who earn PLA credits persist through and complete their programs at a higher rate than students who do not earn PLA credits.[74] PLA is frequently a strategy used to support veterans transition between their military and civilian careers by awarding credits based on the Joint Services Transcript.[75] PLA can also help businesses translate employees' competencies gained through corporate training to requirements for academic programs, resulting in time and cost savings for individuals pursing additional training.[76]

Competency-Based Education

An alternative to the traditional academic credit unit based on seat time, competency-based education (CBE) awards students credits for mastery of educational objectives. CBE offers students more flexibility to master subject areas and skills at their own paces. Some students may even be able to earn credits more quickly. By aligning educational standards and business-sector needs, students can also have more flexibility to complete CBE credits that are directly applicable to their current or prospective professions. However, a limitation of CBE can be the difficulty of aligning the model with regulatory, state authorization, and accreditation standards for credit-hour equivalencies.[77]

PARTNERSHIP PROFILES

To better understand how community colleges and businesses are working together to help students gain necessary education and training, we interviewed education and workforce development stakeholders from across the country. Some of these partnerships involve direct collaboration between the community college and a local employer, while other partnerships also involve an array of stakeholders including those from the K-12 school system, four-year colleges and universities, state government agencies, and industry organizations. This section of the report includes five profiles of exemplar community college and business sector partnerships across the country: South Carolina Technical College System, Washington State Community and Technical College, the Miami Animation and Gaming International Complex (MAGIC) program at Miami Dade College, the Maricopa Community College District, and Maryland's Pathways in Technology Early College High Schools. These colleges and programs were chosen for their partnerships between the education and business sectors, as well as their efforts to prepare students for changing workforce needs. The profiles also highlight the best practices employed by these partnerships to ensure students are continually developing their skills to meet business needs over time.

SOUTH CAROLINA TECHNICAL COLLEGE SYSTEM

As part of the South Carolina Technical College System, Greenville Technical College in Greenville, South Carolina and Tri-County Technical College in nearby Pendleton, South Carolina are helping students succeed in the local manufacturing industry and emerging fields by working to prepare students for modern careers. In particular, these colleges have focused on partnerships and apprenticeships with large auto-manufacturing companies to educate and train students and existing employees for in-demand jobs. These programs are part of a larger effort to expand apprenticeship opportunities across South Carolina.[78]

For this profile, ACCT interviewed leaders from both colleges, including Dr. Keith Miller, president of Greenville Technical College; Dr. Jermaine Whirl, vice president of learning and workforce development for Greenville Technical College; and Dr. Ronnie L. Booth, president of Tri-County Technical College.

Automotive Industry Partnerships and Beyond

Greenville, South Carolina is home to many manufacturing plants; however, employers face a common problem of finding employees with the right skills to meet their business needs. As a result, education and business leaders collaborated to establish apprenticeship programs tailored to the industry. Both Greenville and Tri-County technical colleges have partnered with BMW, one of the largest manufactures in the state, to offer the BMW Scholars program. The BMW Scholars program is a two-year apprenticeship program that allows students to complete coursework to earn an associate degree while also gaining on-the-job training with the latest technologies to prepare for a career in the manufacturing industry.[79]

BMW Scholars is one of the more well-known apprenticeship programs in state and nationally; however, both colleges specialize in partnering with a range of manufacturing companies to design programs specific to their business needs. After starting the broader Tech Scholars program, in 2012, leaders from Greenville Technical College, along with other technical colleges in the region, worked with BMW to establish a formal partnership. Knowing that the area was experiencing an employment gap for skilled workers in the manufacturing industry,

BMW became interested in the apprenticeship model as an opportunity to develop a skilled workforce by recruiting students from local high schools preparing to transition to postsecondary education or work. To develop the apprenticeship program, faculty from Greenville Technical College worked closely with human resources and training managers from BMW to design a curriculum specifically tailored to BMW's needs--incorporating a variety of courses such as mechatronics, management, accounting, and foreign language. According to Dr. Whirl, the key to developing this partnership was flexibility and customizing the curriculum to meet BMW's specific business practices.

The creation of the BMW Scholars program is part of Greenville Technical College's broader effort to shift away from "traditional," discrete education and training programs to a system focused on continual lifelong learning—starting in high school and spanning to reach existing and older workers. The college works in close partnership with local businesses from all sectors, the local and state economic development boards, the K-12 system, and community-based organizations. Through an academic program review process, with review stages at the one-, three-, and five-year marks, Greenville Technical Colleges' academic advisory boards review program curriculums and students' outcomes to ensure curriculum is up-to-date and aligned with industry needs. Academic advisory boards are facilitated by leaders at the college and include deans, program directors, instructors, and industry experts.

Since working with BWM, Greenville Technical College has expanded its partnerships with employers with the creation of a new degree program: a bachelor's degree of applied science in advanced manufacturing technology, for which the region's large manufacturing employers, including Michelin, GE, and Bosch Rexroth, had expressed a need. This new degree will prepare graduates to assume technical and managerial leadership positions in the growing global manufacturing sector, which drives South Carolina's economic strength. The program bridges the gap between an associate degree in machine tool technology or mechatronics and a bachelor's degree covering technical skills beyond the two-year credential. Legislation permitting the state's technical colleges to offer the degree was recently signed into law, and the college is seeking further approvals from accreditors.

"With the signing of this legislation, the game has changed in South Carolina, giving Greenville Technical College improved ability to meet the workforce needs of industry," said Dr. Miller. "We greatly appreciate our leaders in state government for recognizing the need to add a tool that allows us to deliver on our mission of transforming lives through education as we build a strong workforce."

Tri-County Technical College is taking similar steps and has a wide variety of workforce-training programs, including in the manufacturing, banking, and health care industries. In addition to BMW, one of Tri-County's largest manufacturing partnerships is the Michelin Manufacturing Scholars (MMS) program, modeled on the evidence-based Integrated Basic Education and Skills Training (I-BEST) program.[80] The program started with a grant from Duke Energy and with a focus on offering more retraining opportunities for unemployed and underemployed adults in the area. According to Dr. Ronnie L. Booth, President of Tri-County Technical College, the key to establishing and sustaining a strong partnership is consistent communication between the college and the business.

Tri-County relies on advisory boards to ensure that their workforce development curriculums are aligned with industry needs. Dr. Booth also works to build more direct relationships with each business partner, listen to their needs, and ensure that each program is specialized. For example, while BMW Scholars is a two-year associate degree program, Michelin Manufacturing Scholars is a short-term certificate program. The variety of program lengths is a benefit for students looking for different educational experiences and helps ensure that each employer is training its workforce in a timeframe suitable for its business practices.

New Partnerships for Growing Industries

In addition to working with manufacturing industry partners, Tri-County Technical College and Greenville Technical College are working to integrate short-term, non-credit training programs and long-term, for-credit programs to fill urgent employer needs in growing industries. One example is Greenville Technical College's new partnership with Facebook and the Carolina Code School to train local business managers on how to better use digital advertising.[81] According to Dr. Miller, many discussions about workforce development are centered on the skills gap in the manufacturing industry; however, this problem also exists in digital fields. To address this need, the program will prepare students with in-demand digital marketing skills. Originally, the program started as a partnership between the college and the Carolina Code School. By extending the partnership to Facebook, Greenville Technical College will be able to scale up its coding program and Facebook will benefit by having more businesses' managers trained in using its digital advertising tool. Students will start by participating in a 12-week coding boot camp and then continue their education at the community college, receiving prior learning assessment credits for their coding course work.[82]

Additionally, Tri-County Technical College is also developing apprenticeship models in fields ranging from banking to health care. An advisory board consisting of industry professionals is assigned to each program. This ensures that the curriculum aligns with workforce training to best serve the students' and employers' needs. Like Greenville Technical College, Tri-County Technical College focuses resources on outreach to high school students. The college has also received state funding for outreach to underemployed and unemployed individuals aged 25 –55 throughout the state.

WASHINGTON STATE COMMUNITY AND TECHNICAL COLLEGES

From manufacturing to technology to agriculture, Washington state encompasses a very diverse set of industries and employment needs. While Seattle and surrounding areas are known for big technology companies such as Amazon and Microsoft, more rural areas in eastern Washington are home to agriculture and sustainable energy industries. Given this economic diversity, community and technical colleges across the state serve an important role in working with local businesses and preparing students for in-demand jobs. Colleges have a lot of autonomy to develop partnerships and curriculum; however, the Washington State Board for Community and Technical College (SBCTC) works to provide oversight and resources targeted toward key industry areas to the state's 34 community and technical colleges. For example, SBCTC facilitates the state's robust registered apprenticeship program and runs 10 Centers of Excellence to promote common curriculums and workforce development strategies for specific industry sectors, such as aerospace and advanced manufacturing, agriculture, allied health, clean energy, and information technology.

For this profile, we interviewed Nancy Dick, former SBCTC Director of Workforce Education; Peter Guzman, SBCTC Policy Associate for Workforce Education; and Mary Kaye Bredeson, Director of the Washington Center of Excellence for Aerospace and Advanced Manufacturing and the Center of Excellence for Unmanned and Autonomous Systems. The following profile provides further detail about the Center of Excellence for Aerospace and Advanced Manufacturing and its partnerships with companies such as Boeing.

Centers of Excellence: Liaisons Between Colleges and Industry Partners

The Center of Excellence for Aerospace and Advanced Manufacturing—located at Everett Community College in the Seattle metropolitan area—is one of 10 centers across the state for industry sector economic and workforce development.[83] The Center of Excellence serves as a liaison between Washington's 34 community and technical colleges and industry partners to develop a skilled and certified workforce. As Director of the Center of Excellence for Aerospace and Advanced Manufacturing, Ms. Bredeson is responsible for convening regular meetings to bring together representatives from the community and technical college and business partners. For example, the center facilitates meetings of curriculum alignment teams which include a variety of stakeholders, such as deans of workforce development, community college faculty, K-12 partners, and representatives from workforce development councils. According to Ms. Bredeson, one of the most important aspects of these meetings is allowing for all partners to voice their needs and concerns.

Working with Boeing and Expanding to New Industries

The partnership with Boeing is one example of collaboration through the Center of Excellence for Aerospace and Advanced Manufacturing. A cornerstone of the partnership is the paid internship program open to high school and community and technical college students, which includes hands-on experience and job shadowing at Boeing plants across the state and in coordination with seven Washington colleges.[84] Previously, Boeing was focused on recruiting employees with several years of experience. However, due to labor shortages, the company needed to expand its recruitment efforts and invest in training entry-level employees who can grow their skills into a long-term career.[85] Participating students can learn about a variety of aerospace manufacturing occupations including electrical work and maintenance, mechatronics, and plant maintenance. Many participating community and technical college students can complete the three-month summer internship program and concentrate on their academic course work during the regular school year.

Across the state, high demand exists to expand industry partnerships and establish new centers in growing industries. For example, in 2015, the Washington State Department of Transportation sponsored a conference to highlight how it uses drones to support infrastructure repair and maintenance. This conference served as a catalyst for establishing the Center of Excellence for Unmanned and Autonomous Systems. According to Ms. Bredeson, identifying which industries have enough workforce demand for a dedicated center is an ongoing process. She is working with business partners and SBCTC to consider new centers focused on industries including automotive, tourism, and cyber security. However, setting up new centers is dependent on available funding. For example, in 2018, Governor Jay Inslee proposed a state carbon-tax bill that would fund three new Centers of Excellence in renewable energy, clean power, and sustainable forestry. Because the legislation has not passed, the new centers are on hold until the next legislative session.[86]

Preparing for the Future of Work with Common Curriculums

The existing 10 Centers of Excellence across the state play a critical role in preparing students for the future of work by ensuring their training keeps pace with technological changes specific to each target industry. In Washington, each college has autonomy over designing its programs and curriculums to meet local industry needs. Too much variation from college to college can make it difficult for employers to find employees with a consistent skill set and knowledge base. Therefore, the role of the Centers of Excellence to align curriculum development, through "Curriculum Crosswalks," becomes even more important to better ensure students are developing a common skill set and are being trained to use the latest technologies.[87]

However, according to Ms. Dick, fully future proofing or recession proofing education and career training is challenging. In response, SBCTC also wants to help students become more resilient against economic and technological tides by focusing on developing their employability skills, including critical thinking, communication, and teamwork. Students gain these skills through applied courses and on-the-job training, as well as through their general education courses required to earn an applied associate degree. The emphasis on technical and employability skills is seen throughout Washington's pathways model, which gives students opportunities to earn certificates, associate degrees, applied bachelor's degrees, and job training within the community and technical college system.

MIAMI DADE COLLEGE MAGIC

Miami Dade College (MDC) is known for its large undergraduate enrollments—the largest of any college or university in the country—and its effort to serve a diverse student population. MDC serves the largest enrollment of Hispanic undergraduates in the country and the fourth largest of Black, non-Hispanic undergraduates. MDC also demonstrates a strong record of student success, based on graduate, transfer, and employment rates.[88] Part of MDC's success has been a result of a commitment to serving a diverse community and preparing students for emerging industries in the Miami-Dade County area. The newly established Miami Animation and Gaming International Complex (MAGIC) is an example of MDC's efforts to prepare students for careers with hands-on training and opportunities to interact directly with local employers.

For this profile, we interviewed Mauricio Ferrazza, the Chairperson of MAGIC, and Dr. Lenore Rodicio, the Executive Vice President and Provost for MDC. The following profile further describes MDC's workforce development strategies, the steps taken to establish MAGIC, and how the college is preparing students for careers in the animation and gaming industry.

Developing the MAGIC Facility and Programs

MDC is focused on creating affordable programs tailored to local workforce needs. Before MAGIC opened, no affordable public postsecondary options existed for students to learn skills for the animation and gaming industry—a growing industry in the Miami area. To start MAGIC, MDC reached out to industry partners for early support. Initially, most of the equipment was donated by industry partners. According to Dr. Rodicio, at MAGIC and for all career-focused programs, MDC's goal is for the classroom to be interactive and simulate the workplace.

A second goal for MAGIC was to develop opportunities both for students looking for their first job and for existing employees needing to upskill by learning how to use the latest software and equipment. Currently, MAGIC offers two associate of science degrees. Starting in August 2018, it instituted a new stackable college certificate in virtual and augmented reality technology for students who want to specialize in this area. More broadly at MDC, the institution is working to ensure all credentials are stackable, giving students the opportunity to build up skills from the certificate, to the associate, and then to the baccalaureate degree level.

An Industry Liaison Connecting Students to Employers

Mr. Ferrazza brings to MAGIC expertise and a professional network from over 25 years of working in film, TV, and animation. According to Mr. Ferrazza, his approach to developing the curriculum for the MAGIC programs was grounded in his experience as an employer and the skills he'd look for in job candidates. His goal is to have MAGIC students ready for employment when they graduate without needing additional on-the-job training.

Beyond basing curriculum on industry needs, Ferrazza works to have students and employers engage on a regular basis. For example, every April the program holds a pitch event for first-year students to present ideas directly to representatives from the animation and gaming industry. From these presentations, industry leaders select which ideas could become marketable products. Students then spend their second year further developing these ideas with support from an industry mentor.

Successful partnerships require frequent interaction between the college and business partners. Mr. Ferrazza makes frequent visits to studios in the Miami area to learn about their business practices and workforce needs. He also makes regular trips to studios in Los Angeles, CA. Every year, MAGIC hosts an "Art of Tech" event bringing together large employers, including Disney and Warner Brothers, to discuss specific business needs and industry trends. Mr. Ferrazza thinks of this event as a "training camp for industry," where participants can think deeply about steps needed to get students ready for their next job.

Applying Animation and Gaming Skills to New Industries

MAGIC students have ample opportunities to gain hands-on experience with the latest technologies in animation and gaming. At the MAGIC complex, students can learn to use the latest software and equipment. They also gain further experience through job shadowing and internship opportunities. And these skills are not just applicable for working in the entertainment industry. MAGIC is also working to prepare students to apply these skills to other industries that are using virtual reality.

MAGIC has identified 10 industries, outside of entertainment, that use virtual reality technology. These include the health care, automotive, advertising, education, hospitality and tourism, space exploration and research, skilled trades such as welding, military and law enforcement industries. Students who want to explore careers in these fields have opportunities for training experiences. For example, MAGIC recently partnered with the largest children's hospital in the Miami area. While the use of virtual reality is different in these fields, the technology is based on the same animation and gaming development software that students learn at MAGIC. As a result, the skills students learn at MAGIC have broad appeal to employers and give students many options for potential careers.

MARICOPA COMMUNITY COLLEGES

The Maricopa Community College District contains 10 independently accredited colleges located in and around Phoenix, AZ. The county has over four million people, and each of its community colleges have diverse program offerings. The district offers students a variety of education-to career-pathways, such as dual enrollment and apprenticeships, and has robust partnerships with businesses in several industries, including the insurance, automotive, manufacturing, and cyber security industries. This profile focuses on one of the district's main partners, the local health care system.

For this profile, we interviewed Dana Saar, a trustee for the Maricopa Community College District; Daniel Barajas, the Dean of Career and Technical Education and Interim Associate Vice Chancellor of Maricopa Community Colleges; Rochelle Rivas, the District Director for Healthcare Education; and Margi Schultz, Administrator for the MaricopaNursing consortium and Director for Nursing at GateWay Community.

Healthcare Concurrent Enrollment Programs

The Maricopa Community College District has robust healthcare training programs tailored for a variety of professions, from entry-level allied health professions to multiple levels of nursing. These programs have established partnerships with nearly 50 facilities where students can complete their clinical experiences. The central health education department plays a key role in maintaining these programs and acts as a neutral liaison between the colleges and the healthcare facilities.

A unique feature of Maricopa's healthcare programs is the multiple pathways the colleges offered to students seeking a degree. For example, the MaricopaNursing registered nursing (RN) program admits students seeking a traditional associate degree pathway, as well as students seeking concurrent enrollment opportunities with one of its six university partners. The concurrent enrollment programs typically see about 1,000 applicants each cycle, and about three-fourths of students in the RN program are involved in concurrent enrollment to some degree.

One challenge that has come from the popularity of the concurrent enrollment option is that there are more applicants than seats available. While nursing programs often have a long waitlist, students can use their wait times to take corequisite courses at their community colleges. Students also receive support from designated nursing advisors who make sure they take the right courses in the right sequences. Nursing students are encouraged to earn stackable credentials as they move through the nursing programs and often find jobs as Certified Nursing Assistants (CAN) or Licensed Practical Nurses (LPN) at facilities where they have clinical experiences.

Staying Current with Workforce Needs

Maricopa's health education programs use several strategies to ensure curriculum keeps pace with workforce needs. Many of the programs' faculty are current practitioners. Students also have simulation experiences in labs that mimic actual healthcare facilities as closely as possible. According to directors Ms. Rivas and Ms. Schultz, hands-on training is important for students, yet they need to be competent in their field before working with actual patients. To create a robust simulation, labs are equipped with the latest technologies, such as high-fidelity mannequins to simulate patients. After students complete their lab requirements, they gain clinical experience at local healthcare facilities with their instructors. These clinical experiences allow students to further develop their technical skills for working with the latest healthcare equipment and to gain the professionalism and soft skills needed for working with patients.

Tailored Services for a Diverse Student Body and Community

Within the healthcare education program, Maricopa offers programs to meet the specific needs of its diverse student body and communities. For example, to support student veterans, Gateway Community College offers a 12-credit LPN bridge course designed for veterans with previous healthcare training, in roles such as a medical technician or corpsman. Three colleges in the district—South Mountain, Phoenix, and GateWay—also offer the Bilingual Nursing Fellowship Program, with the goal to increase the number of nurses who are fluent in both English and Spanish. Mesa and Paradise Valley Community Colleges offer a Paramedic to RN program and several colleges offer the Nurse Assistant program. The Nurse Refresher program, created to assist the RN who has been out of the workforce for five or more years, is offered at Mesa and GateWay Community Colleges. Three skill centers offer a variety of entry-level workforce programs that start students on a career pathway and prepare them to transfer to a college site. Continuing education programs are offered and can be created to meet a specific education or training need of a community partner; low-cost workshops and seminars designed to enhance a students' skill levels are offered throughout the year.

MARYLAND P-TECH PROGRAM

The state of Maryland places a strong emphasis on providing students with opportunities for early college access, such as through dual enrollment and early college high school programs. Students who participate in early college programs are more likely to complete and attend college and have substantial savings on the cost of college tuition.[89] Recent early college access efforts have also been focused on helping students connect their education to future careers. A leading initiative in the state is the Pathways in Technology Early College High School (P-TECH) program—a model for early college access with an emphasis on career preparation. The program spans from high school through two years of postsecondary education towards the completion of an associate degree at no cost to students or their families. Employer partnerships are critical to the model to help students gain the education and skills needed for successful careers.

This profile provides details of Maryland's policy commitments to early college access and how the P-TECH model is being implemented in schools across the state. We interviewed Dr. Lynne M. Gilli, Assistant State Superintendent, Division of Career and College Readiness at the Maryland State Department of Education; Nina Roa, Lead Specialist, Division of Career and College Readiness at the Maryland State Department of Education; and Dr. Bernard J. Sadusky, Executive Director of the Maryland Association of Community Colleges.

The P-TECH Model

Beginning in the 9th grade, the P-TECH program gives students the opportunity to earn their high school diplomas and associate degrees in six years in or less, at no cost. P-TECH began in 2011 in New York City, in partnership with IBM, and has since expanded across the country and internationally. In Maryland, P-TECH sites are currently active in Baltimore City Public Schools, Allegany Public Schools, Prince George's County Public Schools, Baltimore County Public Schools, and Montgomery County Public Schools.[90]

Each P-TECH school is overseen by local school system leaders in partnership with employers and representatives from community colleges. By aligning high school studies, the first two years of postsecondary education, and career development within a single program, students benefit from a clear pathway from high school to college to career. By being directly involved in shaping the secondary and postsecondary course sequence, industry partners benefit by helping students gain the right skills to meet employers' needs and ensure them direct access to a pool of well-qualified students from which to recruit for future job openings.

The P-TECH six-year course sequence is key to the success of the program. Developing and approving the course sequence requires close collaboration between the Maryland State Department of Education (MSDE), the Maryland Higher Education Commission, local school systems, community colleges, and partnering employers. Partners must identify the courses that are required for high school graduation and associate degree completion, as well as align them to skills needed for entry-level careers in the target industry. The six-year academic coursework is also supplemented by job shadowing, mentoring, and a paid summer internship.

Carver Vocational-Technical High School in Baltimore was one of the sites in Maryland to implement the P-TECH program for the 2016-2017 school year. Prior to becoming a P-TECH site, Carver was already implementing several career and technical education (CTE) programs. By partnering with IBM and Baltimore City Community College, Carver developed a new CTE program for students to enter the information technology and cybersecurity fields. The development and funding of the P-TECH partnership for Carver was facilitated by strong support from IBM executives and elected officials, including Maryland Governor Larry Hogan, Baltimore's Mayor Catherine Pugh, and City Council members. Each P-TECH cohort includes 50 students and admission is based on their interests in STEM fields, and at least half of the spots are reserved for students with a family income that qualifies them for free and reduced-priced meals. The first cohort of "P-TECH at Carver" students is expected to graduate in 2020 with associate degrees in Cyber Security Assurance or Computer Information Systems.[91]

State Policy to Encourage Early college Access and Employer Partnerships

P-TECH benefits from statewide policy to provide direct funding for the program. The P-TECH Act of 2016 established state funding for planning grants for six new P-TECH schools. The legislation specifies that state-funded P-TECH schools must establish a memorandum of understanding with an industry partner and a community college.[92] Expanding on the initial investment, the P-TECH Act of 2017 supports the growth of the P-TECH program across the state with planning grants up to $100,000 for up to six additional school partnerships. With a total investment of nearly $800,000 in state planning grant funds, Maryland has established eight P-TECH schools.[93] P-TECH is further supported by supplemental grants to cover costs including textbooks, transportation, and tuition normally charged by the community colleges.

Stakeholders Working Group Emphasizes Sustainable Funding

Under the P-TECH Act of 2016, MSDE convened a working group to monitor the initial implementation and assess the funding needed for the program. The working group was led by Dr. Gilli and involved stakeholders including community college presidents, leaders from the K-12 school systems, business and economic development representatives, and government officials from state agencies for workforce development. The Executive Director of the Maryland Association of Community Colleges, Dr. Sadusky, and leaders from the Maryland Chamber of Commerce were also instrumental in gaining support for and participation in the P-TECH program by their members. During the first year, the working group made recommendations to the state legislature regarding how to ensure program sustainability. The working group subsequently recommended fully funding the program with a combination of support from the state, local school systems, and community colleges.[94]

Next Steps

Across the state, Maryland has considerable buy-in among educators and employers for the P-TECH program, which is expected to grow through the pilot phase. Several accountability requirements have been placed on the pilot sites to help ensure that data are collected and tracked to assess the success of the program and participating students' academic and career progress. More broadly, the MSDE supports the need to expand early college and career opportunities for all students, particularly those who continue to be underrepresented in postsecondary education.

CONCLUSION

To prepare students for successful careers in today's job market and the future, it is essential for community colleges and businesses to work collaboratively. Partnerships can take several forms. They may exist directly between a community college and local employer, or collaboration may involve an array of partners including those from the K-12 school system, four-year colleges and universities, state government agencies, and industry organizations. Existing research and the profiles in this report emphasize common two characteristics of all partnerships: the need to understand the sectors' needs and limitations and to develop strategies that best support students to pursue their academic and career goals.

In the current political, social, and economic climate, community colleges and businesses must address several challenges to support students, including:

- Given the fast pace of **technological change**, predicting business needs in the future is difficult. Researchers agree that over the next several years, occupations and job responsibilities will change as automation becomes more prevalent in the work place. In response, community colleges and businesses will need to develop strategies to prepare students with both technical skills and employability skills to be successful in their careers. Community colleges, businesses, and students will also need to prioritize **continual, life-long learning** as technology and business needs develop.

- While almost half of Americans hold an associate degree or higher, opportunity exists to improve **postsecondary access and completion**. In particular, opportunity is strong for supporting individuals who have **completed some college, but not yet earned a degree**, for help them to fully benefit from the economic gains of postsecondary education. A second opportunity is to support **part-time students**—who have much lower persistence and completion rates than their full-time peers—with programs and services that allow for the flexible and financial assistance needed to balance responsibilities of courses, jobs, and family.

- Federal **funding for postsecondary education and career training** is limited. Over the past decade, federal investments in postsecondary education have increased but have been offset by rapid state disinvestment. Federal funding for career training has been cut significantly, impacting programs for adults, youth, and dislocated workers. Community colleges have also faced restraints resulting from the loss of dedicated funding for community college career training programs and workforce development partnerships. While a renewed political interest in funding work-based learning opportunities, especially apprenticeships, has developed, the new funding in these areas is not enough to compensate for cuts in other program areas. Beyond funding for postsecondary institutions and workforce development programs, many **students also face affordability barriers** and limited financial aid resources to cover the costs of postsecondary education and training.

Existing research points to several strategies that colleges, businesses, and other stakeholders can use to promote student success in the workforce. These strategies can include:

- **Strengthening links between K-12, postsecondary education, and the workforce,** such as with early college access programs focused on career preparation and work-based learning opportunities;
- **Providing students with opportunities for continuous learning,** such as through stackable credentials, deliberate sector pathways initiatives, and upskilling programs; and
- **Recognizing students' skills from a variety of work and learning experiences,** using tools such as prior learning assessments and models such competency-based education.

Other lessons learned from existing research and our partnership profiles include the importance of identifying liaisons who can communicate between different sectors; designing policies to support community college and business partnerships; and implementing academic programs in conjunction with support services to help students navigate college and career planning. Using these strategies will help community colleges and businesses support access to postsecondary education, degree completion, and alignment with businesses needs even as the nature of work changes over time. Ultimately, a partnership between community colleges and businesses can help students and existing workers be successful in their careers and achieve greater economic prosperity.

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