

# State Responses to the **Skills Gap**

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Successful Policies Advancing  
Industry Credentials and  
Manufacturing Education

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# Background and Introduction

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As the U.S. economy continues a tepid recovery from the 2008-2009 recession, a concern heard across multiple sectors is that of a skills gap. Technology is rapidly changing many industries, and the education programs designed to prepare individuals for careers have struggled to keep pace with those technology advances. This is particularly true in middle-skill jobs, where simultaneous declines in the number of vocational-technical training programs and formal apprenticeship programs over the last 20 years have reduced the educational pathways available to students interested in those careers.

One industry where the lack of skilled workers has been well documented is manufacturing. Since the beginning of 2010, over 600,000 jobs have been added in the manufacturing industry, and many respected organizations predict even greater growth as companies choose to expand operations or relocate jobs from overseas into the United States. This growth of the industry, along with a transformation of the workplace driven by technology and automation, has created significant workforce challenges for many companies.

The Manufacturing Institute (MI) and the National Association of Manufacturers (NAM) are driving solutions to these workforce challenges on three fronts: 1) improve the perception of careers in manufacturing to attract more young people to the industry; 2) increase the number and quality of manufacturing education programs offered in high schools, community colleges, and technical schools; and 3) implement policy changes needed to support goals 1 and 2.



In pursuing these goals, the Institute discovered important factors that affect an individual's decision to pursue specific Career & Technical (CTE) and Science, Technology, Engineering, and Mathematics (STEM) educational and career paths. For example, with the widespread availability of Advanced Placement courses for high school students, are there corresponding opportunities for students in technical education to earn college credit? Do credits transfer across institutions as students pursue further education at any future point in their careers? And are local companies involved with the programs, increasing the likelihood of employment beyond completion?

These questions and goals have led The Manufacturing Institute to promote the use of dual enrollment, to encourage articulation agreements between institutions, and to identify, develop and adopt solutions like industry-based credentials that make manufacturing education programs stronger and more attractive.

This review has identified policy innovations in five areas to make CTE & STEM careers and education pathways more attractive to students:

1. **Industry Credentials**
2. **Industry Partnerships**
3. **Credit Articulation**
4. **Dual Enrollment**
5. **Comprehensive State Strategies**

Because so many of the rules and regulations governing policy decisions for these five areas are made in the public sector arena, the Institute has a third goal of educating and informing the public sector on the benefits and importance of these policies. The Institute has worked to inform federal policy directions and, as a result of these efforts, there have been notable advances in federal policy supporting the manufacturing workforce in recent years. The U.S. Department of Labor's Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program has included requirements to incorporate industry-based credentials into their programs. More recently, the newly-enacted Workforce Innovation and Opportunity Act of 2014 includes industry-based credentials as preference for programs receiving job-training funds. Another opportunity to strengthen support for credentials is upcoming, as Congress considers the reauthorization of the Carl D. Perkins Career and Technical Education Act of 2006.

However, due to the structure of U.S. education policy, Congress and the federal government have a limited role in determining policies impacting dual enrollment, articulation, and other similar program features. It is state legislatures, state boards, and state bureaucracies where these policy decisions are made. This report attempts to document best state policies in action.

Because of the relatively recent interest in such program features, the policy approaches by state vary considerably. In the review that follows, the state policies are placed into five, broad categories to allow for comparisons and to pull out best practices. Where possible, results of programs are included in the descriptions, but in many cases, policies are either too new or data systems lack the alignment to provide the necessary metrics. The Institute is engaged in several projects attempting to link educational attainment, employment data, and certification achievement, and subsequent reports in this series will examine results in greater detail.

## The Manufacturing Institute

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As the Authority on the Attraction, Qualification, and Development of world-class manufacturing talent in the United States, The Manufacturing Institute has placed a priority on understanding the conditions for success in attracting and growing a manufacturing workforce. We have found that education and workforce policy plays a critical role in supporting talent pipelines—and that the most impactful policy innovations are taking place in the states.

The Institute's activities to improve the image of manufacturing are led by the Dream It. Do It. Program, a network of regional partnerships across the country where companies, schools and industry associations sponsor and host events, competitions, and other activities that engage youth and promote careers in manufacturing. The Institute and NAM are also co-sponsors of Manufacturing (MFG) Day, a national celebration of manufacturing when companies open their doors and invite students, teachers, guidance counselors, parents, and community leaders to tour their facilities and see the new face manufacturing. In addition, the Institute's Women in Manufacturing program and Get Skills to Work initiative for veterans increase awareness and opportunities for key, untapped labor pools.

The cornerstone of the Institute's goal to increase the quality of manufacturing education programs is the Manufacturing Skills Certification System. Nationally portable, industry-recognized credentials from 15 organizations make up this system, representing a wide range of careers in manufacturing. Over the past five years, the Institute has worked with hundreds of community colleges to embed these credentials into traditional manufacturing education courses. The goal is to improve the quality and consistency of those programs so that manufacturers have confidence that students completing the program and earning the credential have the skills necessary to succeed.

Building a strong manufacturing sector requires a cohesive workforce development strategy involving public and private interests to build a pipeline of skilled workers. State education policies will play a more significant role in enabling students to acquire work-ready skills. Eliminating barriers and providing incentives for institutions and companies to assist students in the acquisition of those skills should be the goal of state policymakers.

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# 1. Industry Credentials

As the economy has changed over the last decade, so too have expectations of both employers and students as to what secondary and postsecondary institutions should provide for students to succeed in the workplace. Students are often no longer looking at postsecondary degrees as an opportunity to enrich their academic understanding, but now see acquiring a degree as a necessary step toward ensuring lifelong economic prosperity through securing a well-paying job upon graduation. The market is responding to this change by creating and expanding on new forms of credentialing.

Certifications provide the opportunity for high school graduates to enter into the labor market with industry-recognized skills that can provide a family-supporting wage. Engaging high schools and community colleges in the certification process, while providing students with the opportunity to earn credit toward their degree, ensures that they will be able to better enter and exit the labor market and increase their opportunities to gain an advanced degree. As industry-backed credentials become more prevalent in the labor market, students will continue to demand these options from their schools. At the present time there is not extensive communication between education and industry organizations in order to meet this demand, and there is little data sharing between certifying bodies and secondary and postsecondary institutions. However, a number of states have responded by better aligning their curriculums to local industry needs. The following states have provided innovative solutions:

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## Colorado

Colorado has recently passed legislation to better align student outcomes with industry demands while also providing students the opportunity to gain hands-on work experience in high-demand fields. The [Manufacturing Career Pathways Act](#), signed into law in May 2013, requires the State Board for Community Colleges and Occupational Education (CCOE), in coordination with the state departments of education, higher education, labor and employment, and the state workforce development council, to design a manufacturing career pathway for skills needed for employment in the state's manufacturing industry. The bill requires the pathway to align with high-demand occupations; include articulated progression through education, stackable industry-validated credentials, career counseling, as well as multiple entry and exit points; and allow a student to earn income while progressing through the pathway. The legislature appropriated \$1 million for the initial year of the program.

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## Florida

The [Florida Career and Professional Education \(CAPE\) Act](#) was signed into law in 2007, with the goal of increasing the partnerships between the education and business communities, and to sustain a knowledge-based economy that would attract high-value industry. The CAPE Act set out to provide additional opportunities to gain industry certifications through relevant career-themed courses that articulate to postsecondary-level coursework, increase academic rigor at the middle and high school levels, support Florida's local and regional economic and workforce needs, and provide residents access to high-wage and high-demand careers. The state achieves this through partnerships between school districts and business groups to establish career and professional academies, with the goal of graduating students with high school diplomas, national industry certifications in high-demand jobs, and college and university credits. Additionally, Florida has implemented a [statewide articulation agreement](#), providing a minimum of 3 hours of credit toward an AAS/AS Degree per approved industry certifications.<sup>4</sup> The state has also created a Gold Standard Articulation [Index](#) which gives exact specification of credits earned for each of the certifications offered, providing a clear explanation of opportunities through each pathway.<sup>5</sup>

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## Louisiana

The Louisiana Department of Education has established a number of funding streams and initiatives to increase access to career and technical education as well as courses that lead to industry certifications. One example of this is the [TOPS Tech Early Start Awards](#), which fund up to \$600 per academic year for up to six credit hours per semester for public high school juniors and seniors in college-level courses that lead to an industry-based certificate in a [Top Demand Occupation](#).<sup>6</sup> In order to ensure that students receive transferable credit for any dual enrollment classes, the state created [Success Through Articulation](#) (STArt), a comprehensive secondary-to-postsecondary articulation agreement for issuing college level credits to high school students that can be utilized as college credits at Louisiana two- and four-year institutions. In 2013 [legislation](#) created a STArt Council to award transfer credit for academic content embedded in career and technical education (CTE) courses as well as courses that lead to industry certification, including dual enrollment.

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## North Carolina

In the fall of 2010, to mark North Carolina's Community College System's 50th anniversary, the State Board of Community Colleges, working with the North Carolina Association of Community College Presidents and North Carolina Association of Community College Trustees, embarked on a plan called [SuccessNC](#) to revamp the community college system. The program set success targets as increasing the percentage of students who transfer, complete credentials, or remain continuously enrolled from 45 percent in the fall of 2004 to 59 percent in the fall of 2014, ultimately doubling the number of credential completers by 2020.

As part of SuccessNC, [Code Green Super Curriculum Improvement Plan \(CIP\)](#) was initiated in 2010 with the goal of integrating energy efficiency skills into the state's technical education pathways curriculum. Code Green Super CIP focused specifically on five sector areas of critical growth: building, energy, engineering, environment, and transportation. This program is unique in that it completely revamped the technical education curriculum and created a system of stackable credentials. The new curriculum, which increases access to thousands of students across the state, has the additional goal of better supporting job growth and industry improvements. The curriculum now centers on goals that recognize student, school, and industry requirements. This starts with streamlining program structures to reduce redundancies in the curriculum, providing curriculum competencies for non-credit students to transition into credit programs through competency-based courses, and increasing access to industry-recognized credentials and workplace competencies. North Carolina's approach creates easier pathways for students to earn certificates, diplomas or degrees in multiple technical programs.

In order to provide highly-skilled teachers for the improved curriculum, the state has created a training system for current teachers to gain experience with to the latest technology and employer-desired skill sets, such as The Manufacturing Institute's Skills Certification System. Teacher training is also provided for individuals working high-demand fields to give students the opportunity to learn from industry professionals. Some schools began implementing this new curriculum in the fall of 2013, and the entire system will be put in place this academic year.





## 2. Industry Partnerships

Another promising initiative at the state level is for local high schools, community colleges, or college systems to partner with local industries in order to bring relevant classes to their institutions, while also bringing the students into the workplace to gain on-the-job experience. This has positive benefits for the companies because they are able to ensure a steady stream of qualified workers. At the same time, it benefits schools, which are able to provide hands-on learning experiences and ensure students who come to their institutions will be able to get high-quality work experience and provide opportunities to lower students' debt burdens. Upon completing courses, when equipped with an industry-backed certification, students will have more opportunities to continue through school or begin working on family supporting wages. The following states have provided innovative partnerships between education and industry:

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### California

The [California Career Pathways Trust](#), which was signed into [law](#) in July of 2013, provides funding for \$250 million in one-time competitive grants. The grants are available to school districts, as well as county superintendents of schools, charter schools, and community college districts. The grants fund specialists in work-based learning to establish or enhance a locally-defined career pathway program that connects the education community with the local business community. The grants must also fund integration of career-relevant curriculum following industry-themed pathways in high-need, high-growth economic sectors and provide articulated pathways to postsecondary education. Finally, the grant application must show that the applicants: 1) leverage existing Perkins funding or in-kind contributions from public, private, and philanthropic sources; 2) engage with the California Community Colleges Economic and Workforce Development Program; or 3) participate in the local California Community Colleges Skills Panel. The state has already appropriated an additional \$250 million for FY 2015.

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## Indiana

Throughout 2013 and 2014, Governor Mike Pence and the Indiana legislature have been putting forward a number of bills targeted at creating industry partnerships to bolster internship opportunities for students. During the 2013 session, the Indiana legislature unanimously passed the Indiana Works Councils and Indiana Career Council to better align education and workforce efforts. Both Councils draw on public and private sector expertise to coordinate participants in the state's educational, job skills, and career training systems. The 11 regional Works Councils focus on alignment of regional CTE training with local business needs, and this year awarded \$3.2 million in innovation CTE training grants to school/business partnerships. This council also has a key goal of providing work-based learning opportunities for high wage high demand jobs. The Career Council's mission focuses at the state-wide level to encourage college completion and/or, postsecondary skills, and improved performance of the state's career services to students and adults. Indiana has also created a number of career academies, which serve as one of many options for high school and middle school students.

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## Kansas

Kansas has traditionally been a leader in implementing innovative and incentive-based statewide improvement in CTE opportunities at the secondary and postsecondary level. The state is now providing incentives to better train their CTE instructors and recruit the best talent to teach required courses. The [Kansas Technology Innovation and Internship Program](#) provides grants to CTE institutions for technical courses or programs in emerging technologies, manufacturing, or areas of skill shortages. The CTE faculty internships provide opportunities for CTE instructors to work in an industrial setting or enable industrial employees to work in an educational setting at CTE institutions in order to give instructors hands-on experience in the area they are teaching. The legislation mandates that the local or regional private business participating in the grant must provide financial or in-kind support to the CTE institutions equaling 100 percent of the amount of the grant.

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## North Dakota

With a recent economic boom and increase in technical skills needed to match industry demands, North Dakota has chosen to respond through a program called [Operation Intern](#), administered through the North Dakota Department of Commerce. Governor John Hoeven first created this program, which was approved by the state legislature in 2007 and has been carried on by Governor Jack Dalrymple. Beginning in the 2009-2011 biennium, the program expanded to high school juniors and seniors in order to

increase the number of new internship, work experience, and apprenticeship positions with North Dakota employers. To incentivize businesses to participate, North Dakota Department of Commerce offers \$3,000 in matching funds per internship approved, up to \$30,000 every two years. In the 2013-2015 biennium, Governor Dalrymple and the legislature invested \$1.5 million toward Operation Intern. The number of internships has nearly doubled in each two-year cycle since the program's inception in 2007.

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## Ohio

Governor John Kasich has pushed forward multiple workforce development strategies aimed at aligning Ohio's higher education curriculum and investments with skills in demand by business in order to ensure students are workforce prepared. In spring 2014, almost [\\$11 million in grants](#), funded through casino license fees and with 100 percent matching funds from industry, were distributed to Ohio community colleges and universities over a two-year period for new or expanded co-op and internship programs. A total of 10 community colleges and 15 public or private universities are partnering with 30 other postsecondary institutions, including 11 Ohio technical centers. The funds are used for higher education institutions to: establish relationships with businesses; build campus infrastructure for the internship programs; integrate internship programs into curriculums and better align them to regional industry needs; enhance faculty professional development in key areas; and engage and incentivize students to participate in the program. While Ohio higher education institutions benefit from the influx of funds, this program also provides Ohio businesses with an opportunity to help shape the higher education and workforce dialogue. The latest data shows that, of participating employers, 55 percent were new to the concept of utilizing internships/co-ops as a talent tool.

That state has also pushed forward new [grant funds to expand and develop new workforce development education and training programs](#).<sup>21</sup> to expand and develop new workforce development education and training programs. The programs will fund the purchase of skills training equipment, such as welding or robotics equipment, for the targeted regional industry for nine community colleges and three universities. These institutions will partner with more than 45 companies and 25 other postsecondary institutions, including 8 Ohio Technical Centers, as well as businesses in their region to provide education and training to meet occupational and skill needs in key [JobsOhio](#) industry sectors.<sup>22</sup>

The Governor has also created an "In Demand Jobs" list with the Department of Job and Family Services using a combination of labor market data, open jobs in the state job matching system, and survey responses from Ohio businesses. The Ohio Board of Regents is assimilating that data by plotting education enrollments against the "In Demand" list in order to determine future education planning for schools, career counselors, parents, and prospective students to determine careers and related education. An additional effort on this front, "Workforce Alliance Grants," comes from

the Ohio Board of Regents, the Ohio Department of Education, the Department of Job and Family Services, and the Governor’s Office of Workforce Transformation. These competitive grants target career pathway development through employer engagement, postsecondary pathways with multiple entry and exit points and a deeper acquirement of GED credentialing.

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## South Carolina

[Youth Apprenticeship Carolina](#) is part of the larger [Apprenticeship Carolina](#), which has seen a 631 percent increase in registered apprenticeship programs and a 556 percent increase in the number of apprentices in the state since the program started in 2007. The youth apprenticeship program is unique in that it focuses on students in high school, giving them the opportunity to continue with their classroom education while simultaneously gaining on-the-job training and an early start on wage progression. Employers who take on apprenticeships are awarded a \$1,000 tax credit per apprentice and are given access to complimentary apprenticeship consultants to guide them through the registered apprenticeship development process. Apprenticeship Carolina has gained attention from across the country and has been featured in reports by the [White House](#) and [Brookings Institution](#).<sup>24</sup>

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## Wisconsin

Wisconsin Governor Scott Walker has pushed forward [legislation](#) to enact Wisconsin Fast Forward (WFF) funding, the state’s “Blueprint for Prosperity,” which includes the [High School Pupil Workforce Training Program](#).<sup>25</sup> Using [\\$2.1 million](#) in state funding, this competitive grant program focuses on collaboration among school districts, technical colleges, and businesses.<sup>26</sup> In 2013 the state awarded [30 grants](#) to collaborations throughout the state with credit-granting high schools and technical colleges providing [industry-recognized certifications](#) and employer-driven workforce programs. Grant funds can be used for course development, instructor wages, and course materials but not tuition or capital improvements. The grants also work to ensure accountability and transparency by tracking program participants, training completions, certifications earned, job placements, and further enrollment in postsecondary training.

# Private Sector Takes the Lead

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## California

In response to a continuous shortage of work-ready talent, PG&E (Pacific Gas and Electric) created [PG&E PowerPathway™ Training Network](#) to ensure its ability to address the workforce needs of the company and communities it serves. PowerPathway is a collaborative effort between local community and four-year colleges, the public workforce development system, and unions, with the goal of creating a larger talent pool of qualified candidates to fill vacancies in clean tech vehicles, energy efficiency and renewables, engineering and the smart grid, and skilled crafts. These are organized through PG&E PowerPathway™ Training Network, which has now expanded to reach out to [military veterans](#) transitioning into the energy sector. Since 2008 more than **400** students have received training, of which 71 percent went on to be employed by either PG&E or one of its suppliers, and 70 percent progressed into a higher job classification within one year of being hired.<sup>29</sup>



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## Kentucky

The [Kentucky Federation of Advanced Manufacturing Education \(KY FAME\)](#) is a partnership that was created through Toyota Motor Manufacturing and is now growing to include between 10 and 15 regional manufacturers. These manufacturers partner with their local community college to operate the Advanced Manufacturing Technician (AMT) program. All students enrolled in KY FAME are sponsored by a participating member of the federation. The students attend classes two days a week and work for their sponsor for pay three days a week. By the end of the program, students attain an associate of applied science (A.A.S.) degree, earn 70 to 80 college credit hours, and have two years of work experience. Students also graduate from the program free of debt, as all fees are paid while the student works. The success of the program has garnered national attention, and in 2013 was awarded first place in the [Career Pathways Partnership Excellence Award](#) competition by the National Career Pathways Network.<sup>31</sup>

In an effort to capitalize on the success of the program, Governor Steve Beshear proposed to spend [\\$24 million in General Fund](#)-supported bonds to build an advanced manufacturing training center in Georgetown, KY, which will be associated with the original AMT partner, the Bluegrass Community and Technical College. This move by the state shows the importance of collaboration with industry partners to increase opportunities for students and workers. At the same time, the Governor called for authorizing \$145.5 million in agency bonds for the Kentucky Community and Technical College Systems for up to 75 percent of project costs, sponsoring one project at each of the KCTCS colleges. Efforts are currently underway to expand KY FAME statewide.

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\*Any high school student participating in dual enrollment at the [BCTC](#) campus is required to pay the regular BCTC tuition and fees rate.



## 3. Credit Articulation

Many states offer high school students the opportunity to earn college credit while completing courses toward their high school diplomas. This gives students an advantage to place out of courses they've already passed while in high school, but only if the state has a clearly defined articulation agreement in place. If states do not have these agreements in place, it can result in not only lost credit for students, but also time and money spent retaking courses they have already completed.

This issue can also affect community college students attempting to transfer to four-year institutions, especially those earning their associate of applied science (A.A.S.) degree. Without strong articulation agreements in place for credit transfers, four-year institutions may choose not to acknowledge credits earned for courses they do not specifically offer at their institution. Many states have taken measures to protect students from the financial and time penalties of poor credit-transfer policies. Solutions include creating pathways students can access as early as middle school, ensuring students earning their A.A.S. can transfer on to a four-year degree, and better articulating transfer agreements from technical institutes to four-year institutions. The following states have some of the strongest credit articulation agreements:

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## Colorado

Colorado has approached transferrable credit by looking at both secondary and postsecondary systems together. The state has created [Advanced Credit Pathways](#), which allow secondary students to transfer approved CTE credits and competencies to their related courses at Colorado's community colleges.<sup>34</sup> The focus of the [program](#) is to ensure rigorous courses that incorporate both secondary and postsecondary aspects while also ensuring coordination to avoid course duplication resulting from credits not transferring. Colorado also has a unique approach to secondary graduation requirements in that local school boards may set their own graduation requirements, which can include the dual enrollment courses, so long as they "meet or exceed" the minimum competencies or skills adopted by the State Board.

Additionally, the state has developed an [online course builder](#), which allows CTE teachers to build courses based on industry-defined and academic standards.<sup>35</sup> These CTE courses may be approved for both [CTE and academic credit](#).<sup>36</sup> The state also allows students who earn 60 credit hours toward an associate degree to transfer them to a four-year institution through the state's [60 + 60 transfer plan](#).<sup>37</sup> This ensures that any eligible community college student will begin with two full years of the four-year requirements completed.

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## Missouri

Over the last several years, Missouri's legislature and Governor Jay Nixon have worked to increase access to affordable education and credentials in in-demand industries such as manufacturing. One way they have done this is to establish criteria for statewide articulation agreements, starting with CTE programs that have a national certification or credential and including program competencies as well as end-of-course or program assessments. The state also requires the Coordinating Board for Higher Education (CBHE) to "establish guidelines to promote and facilitate the [transfer](#) of students between institutions of higher education within the state."<sup>38</sup> The state has reinforced its commitment to dual enrollment by proposing \$2.3 million for extending dual credit for [fiscal year 2015](#), and the Governor has proposed \$5 million for the [Certified Work Ready Community Initiative](#) and \$1 million for business-education partnerships.<sup>39</sup>

In 2013, Missouri passed [legislation](#) to create an [Innovation Education Campus Fund](#) for educational partnerships between high schools or districts, a Missouri four-year school, a Missouri-based business, and either a Missouri public two-year institution or Linn State Technical College. This program promises to reduce or eliminate tuition, decreases the amount of time it takes to earn a degree, and provides opportunities for applied and project-based learning. The success of the program has garnered national attention, and [University of Central Missouri](#) has welcomed President Obama and leaders from around the country hoping to make an example of the program and support implementation in other states.<sup>42</sup>

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## Oklahoma

Today, Oklahoma's Career Technology Centers provide the majority of technical training for the state while also offering transferrable college credit to the state's secondary and postsecondary students. This has not always been the case. Prior to the state's adoption and implementation of its [Cooperative Alliance](#), any secondary or postsecondary student enrolled in courses at the state's [technology centers](#) technology centers were able to receive technical, but not college, credit. Since establishing the alliance, high school students who enroll for part of the day at their area career technology center are able to receive college level course credit they can transfer to postsecondary institutions after graduation, while simultaneously receiving credit to complete their high school diploma.\*

Oklahoma is unique in developing a relationship between the state's public K-12 system, the CareerTech system, and the higher education system. This relationship allows high school students to complete their high school requirements while earning college credit toward an A.A.S. degree at technology centers and colleges at a cost of only \$8 per credit hour to students . Six of the participating technology centers are endorsed by [The M List](#), recognizing their alignment to the Manufacturing Skills Certification System. Career technology centers are funded through state funds, tuition from postsecondary students, and a property tax assessed in each district with a technology center.

Oklahoma is one of the few states that have specifically addressed credit transfers for A.A.S. degrees. The Oklahoma State Regents for Higher Education created an articulation agreement providing for an A.A.S. degree to be applied toward a bachelor of applied technology degree at the state's four-year institutions. The Oklahoma State Regents for Higher Education also acknowledges learning students gain [outside of the higher education classroom](#), which is then evaluated for college credit through prior learning assessments. These two initiatives have given students additional opportunities to gain experience both in and out of the classroom, providing incentives to remain in school and be better prepared and able to afford a postsecondary education.

\*At the time of publication, the articulation agreement developed as part Oklahoma's Cooperative Alliance is in jeopardy of full enactment.

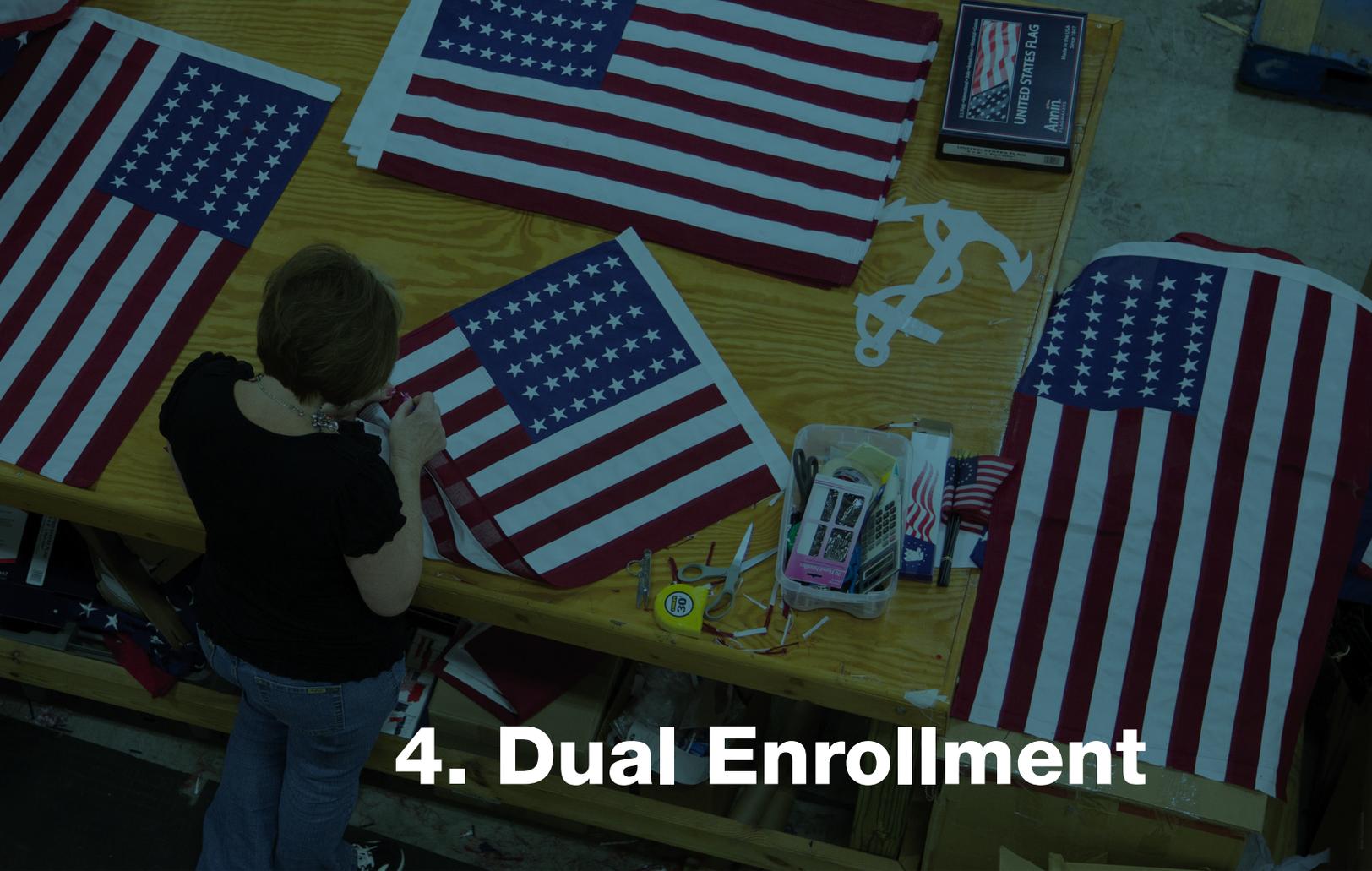
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## Washington

Washington Integrated Basic Education and Skills Training (I-BEST), designed by the Washington State Board for Community and Technical Colleges (SBCTC), has grown into a nationally recognized program since its inception in 2004 as an attempt to provide adult education and English Language Learners (ELL) with stronger employability skills. One of I-BEST's most notable attributes is the inspiration it has given states across the country for implementation. In building their own delivery systems, many states have taken the basic structure of I-BEST and incorporated the best components, especially the approach of pairing basic education with professional or technical faculty in the same classroom. This is a perfect example of state collaboration and sharing of best practices to bring forward enhanced academic and career opportunities for students.

I-BEST was designed to directly transition into college-level programs and therefore moves students further and faster to certificate and degree completion than in a standard classroom setting, and tracks a number of metrics, such as college credits and workforce credentials earned.<sup>48</sup> The program now gives students the opportunity to complete basic skills in reading, math, writing, or English language while also receiving professional and technical content instruction. Students have the opportunity to gain real-world experience while simultaneously gaining basic academic content knowledge, with the goal of keeping students engaged and fully preparing them for future employment.





## 4. Dual Enrollment

A number of states have addressed the issue of high school students getting into meaningful, college credit-bearing courses by supporting dual enrollment. Dual enrollment gives high school students the ability to complete their graduation requirements while concurrently taking college-level courses through a local postsecondary institution. Dual enrollment removes barriers for earning stackable, portable credit for classes taken and decreases tuition prices prior to full postsecondary enrollment. CTE dual enrollment courses give students an alternative to AP courses that, like AP courses, give them an opportunity to gain college-level experience and credit while earning their high school diploma. These credits can be seen as an equal currency of exchange to AP credits, as students gain college credit for each.

A study conducted by the Community College Research Center (CCRC) on dual enrollment participation in Florida and New York City revealed that students who enroll in dual enrollment programs are more likely to earn their high school diploma, enroll in community college and four-year institutions, and to enroll full-time than students who are not participating in dual enrollment. Additionally, once these students are in college, on average they have a higher persistence rate, grade point average, and credit accumulation. Dual enrollment students experience little fadeout effects from their high school courses, as they are projected to earn 15.1 more college credits than their non-dual enrolled peers 3 years after high school graduation.

Although statistics show that dual enrollment has a positive effect on students, many states do not participate or have weak dual enrollment programs. There are often significant disincentives for students and school districts to participate because of the economic costs of enrollment. There is not a national payment model for dual enrollment, meaning each state is left to create its own rules and funding streams. In states where the cost of college or community and technical courses are not covered by the state government, students are often forced to pay the full tuition for any course they enroll in, or the school districts must pay for these courses on top of the courses they are already providing for students. When schools are forced to pay for students to enroll, this creates a strong disincentive for teachers or school counselors to promote enrollment of their students. Other states, however, have put forward initiatives and financial incentives to promote student enrollment and engage school districts to promote their students to enroll. The following states are examples of promising programs, many spurred by governors or state legislatures:

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## Kansas

Governor Sam Brownback's [2014 State of the State](#) address lauded a 75 percent increase in enrollment in career technical education programs since [Senate Bill 155](#) was passed in 2012.<sup>53</sup> Kansas has been a leader in engaging students in thinking about career pathways, college preparation, and workforce development as early as eighth grade through legislative action, including recommending an individual career plan for each student enrolled in grades [8 through 12](#).<sup>54</sup> Kansas has also been a leader in creating incentives for high schools to take advantage of student success in dual enrollment, especially in regard to CTE, by awarding \$1,000 per high school graduate to the sending school district if a student earns an industry-recognized credential in a high-need occupation. These awards must in turn be used to reimburse students for up to half the cost of an industry-recognized credential assessment. Additionally, high school students are eligible to receive free tuition for college-level CTE courses, including night and online classes. The state has also implemented the [Kansas WORKReady! Certificate](#), a credential that gives employers and jobseekers a uniform measure of key workplace skills. These initiatives have given students many more opportunities for access to postsecondary education while local industries are able to count on a more reliable stream of qualified workers to fill the skills gaps that currently exists.

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## North Carolina

North Carolina, as part of [SuccessNC](#), implemented the [Career & College Promise](#), through a partnership of the North Carolina Community College System, the Department of Public Instruction, the University of North Carolina system, and many independent colleges and universities. The program allows eligible high school students to earn college credit at a community college campus at no tuition cost to them or their families. The program is paid for through state funds, and students are able to transfer

up to 30 hours of course credit to community colleges. Once students enroll in the community college and complete their A.A. or A.S. degree, they can then transfer up to 40 credit hours to a four-year institution and enter as a junior. While the Career & College Promise is only available to 11th and 12th grade students, the state has also extended a dual-enrollment pathway to qualified 9th grade students through the [Cooperative Innovative High School Programs](#).<sup>58</sup> These small public high schools located on college campuses provide ninth grade students the opportunity to complete a high school diploma and an associate's degree in four to five years.

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## Wisconsin

Wisconsin, in an effort to curtail workforce shortages in key industries, passed [legislation](#) in December 2013 to create \$1,000 [Career and Technical Education Incentive Grants](#), which are awarded to public high schools throughout the state for each student who graduates with a work-based learning or industry-recognized [credential](#).<sup>59</sup> The program targets industries or occupations in consultation with the Department of Workforce Development (DWD) and the Wisconsin Technical College System (WTCS) that are identified as having potential future workforce shortages. The legislature has allocated a total of [\\$3 million](#) for the 2014-2015 school year. Wisconsin is an excellent example of a state that adapted the best components of promising models from partners (such as Kansas and Washington's I-BEST program) to create a program that best fits its own education and workforce needs.

## High-Quality Remediation

States often struggle with the best method to provide remediation to students in order to ensure that they are able to complete their high school courses and continue on to postsecondary education. Lacking basic functionality in mathematics can significantly hinder student success and attainment in STEM or CTE courses. Florida has attempted to address this by giving students who are interested in technical careers but lack a strong math foundation the opportunity to take advantage of [College Success Academies](#) their senior year of high school. The Success Academies are comprised of both remedial and dual enrollment courses, which are found to better help students prepare for college.

Through state legislation enacted in 2008, students now have an opportunity to engage in postsecondary readiness testing while also enrolling in remediation, all prior to high school graduation. Through the College Success courses, students are able to gain 2½ high school credits and 6 college elective credits. This initiative gives students the opportunity to take remediation courses while also giving them the credit they need to both complete college and have tools for success after graduation.

To bring these initiatives full-circle for students, the state takes advantage of [Manufacturing Day](#) to raise awareness of the employment opportunities offered in Wisconsin, and has broadened its scope to include [Manufacturing Month](#).<sup>61</sup> Employers from across the state have come together for the month of October to help promote manufacturing as a viable career choice.

## Local Manufacturing Association Initiative

The San Antonio Manufacturers Association (SAMA) convened members to support Alamo Colleges and the Alamo Academies in an innovative public-private partnership to close the skills gap. More than 50 area high schools partner with the Alamo Academies, a “Higher Education Dual-Credit Career Academies” model, to provide students an immersive experience in a manufacturing-related curriculum. The Academies provide a college pathway for high school juniors and seniors to attain industry and academic certificates, such as [MSSC certificates](#), that lead to high-wage jobs or to further higher education while addressing critical workforce industry needs.

While in high school, students are dual enrolled at Alamo Colleges, where they engage in 2½ hours of instruction needed to complete a 1-year technical college program of studies as part of the A.A.S. degree pathway. During their junior and senior years of high school, students earn 31-34 college credits. Academies students complete an industry-paid internship in the summer between their junior and senior years, working full time for 8 weeks for a participating employer, earning approximately \$3,000 for the summer. Upon graduation, students can either enter a high-demand, high-tech career or continue with their education. The internship also allows employers to test the students before employment.

Partners, including Boeing, Lockheed Martin, Toyota, CPS Energy, ITM, Rackspace, contribute over \$2 million to support operating costs. The Alamo Colleges provide facilities, equipment, and instruction; school districts provide textbooks and round trip transportation; employers pay their interns’ salaries; and cities fund operating costs.



## 5. Comprehensive State Strategies

An emerging practice is to take a comprehensive approach to addressing each of the initiatives outlined above, and use a common vision to create change. Three states—Illinois, Tennessee, and Oregon—have created comprehensive strategies aimed at addressing the skills gaps their state economies face by engaging education and industry partners from across the state. All three states have an ultimate goal of increasing the percentage of their state’s population that is workforce ready through measures targeted at every level of education with industry credentials. These states also emphasize portability, stackability, and on- and off-ramps for student workers, and include industry partners to ensure that the state is producing a competitive workforce with marketable skills. In each state, governors and legislatures have partnered in a bipartisan manner in comprehensive statewide collaborations.

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## Illinois

[Illinois STEM Learning Exchanges](#) are part of the [Illinois Pathways](#), an initiative funded through Race to the Top (RTT), focus on supporting local implementation of P-20 STEM Programs of Study. The goal of the Illinois Pathways is to advance statewide public-private education partnerships that provide an infrastructure to advance college and career readiness based on [career clusters](#) from preschool to graduate school (P-20). The STEM Learning Exchanges work as a collective impact strategy and are organized into nine sector-specific areas to better coordinate planning and funding, leverage resources, review talent supply-chain performance, and support employer investments. The program is designed to track local and statewide performance as well as connect with local programs and industries. Each of the sectors is [governed](#) by its own consortium of education, business, and community partners and, while being required to have a state-approved strategic plan and state designation, each sector operates and receives public investment independently. Illinois initially seeded the effort through [\\$3.2 million of its RTT funding](#) to support the STEM Learning Exchange and has now capitalized on four main funding [sources](#), including federal, state, business, and philanthropy for the Illinois Pathways.

This state is an excellent example of taking advantage of nationwide initiatives to provide better opportunities for students across the state. Illinois has joined with Jobs for the Future's [Pathways to Prosperity Network](#), adopted the sector model of National Association of State Directors of Career Technical Education Consortium's (NASDCTEc) [Career Clusters](#) for their sector models, and have joined Lumina Foundation's [Goal 2025](#), a goal of 60 percent of the state's population will have some form of high quality degree or credential by 2025.<sup>67</sup> Each of these initiatives have brought in new networks and funding sources to improve the state's academic resources and contribute to current state-led initiatives.

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## Oregon

Oregon's Governor John Kitzhaber describes the [40-40-20 Goal](#) as the state's North Star, its compass for future state success and prosperity. Passed in 2011 through bipartisan majorities in both state houses, the [bill](#) includes a goal that by 2025, 40 percent of Oregonians will have a bachelor degree or higher, 40 percent will have an associate degree or postsecondary credential (including an [apprenticeship](#) registered with the State Apprenticeship and Training Council), and 20 percent will have obtained their high school diploma or its equivalent. The legislature passed a supplemental [bill](#), which called for the creation of a student-centered, unified public education system from preschool through graduate school (P-20) to achieve the [40-40-20 Goal](#).<sup>76</sup> The bill additionally called for the creation of the Oregon Education Investment Board (OEIB), which was charged with ensuring that all students were able to reach the goal and making legislative recommendations to ensure success.

The legislature has taken a number of steps to fund the 40-40-20 Goal. This includes allocating \$11.5 million during the 2013-2015 biennium to fund the [CTE Revitalization Grant](#), which supports applied learning of CTE programs, and [\\$8.5 million](#) over the next two years to jumpstart the [STEM Investment Grant program](#) to help youth get interested in STEM.<sup>79</sup>

Since that bill's passage, Oregon has enacted numerous legislative measures aimed at increasing CTE educational and [work-based](#) learning programs and connections between [secondary and postsecondary education](#), including the [Connecting to the World of Work](#) Program and the [Community College Outreach program](#).<sup>77</sup> Other initiatives aim to increase [dual credit](#) or enrollment opportunities, create additional resources for job opportunities with [youth job organizations](#), and [direct](#) a commission to develop standard requirements for associate transfer degrees.<sup>78</sup>

Finally, the state has enacted [legislation](#) to ensure communication between the Department of Education, the Department of Community Colleges and Workforce Development, and the Bureau of Labor and Industries, requiring they meet at least four times a year to develop and implement long-term goals relating to career and technical education. The bill also establishes the Career and Technical Student Organization (CTSO) Grant Program, allotting \$500,000 over two years.

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## Tennessee

### [Drive to 55](#): Mission: Workforce Ready

The Goal of Drive to 55 (D55) is to bring the state's percentage of Tennesseans with a college degree or certification to 55 percent by 2025. This includes increasing the number of two-year and four-year degrees as well as technical certifications in state-identified important fields such as welding and mechatronics. Through governor and state legislative cooperation, the state has passed the Tennessee Promise, Tennessee LEAP, and [Tennessee Reconnect](#), which focus on postsecondary affordability, workforce alignment, and disconnected workers, respectively. Drive to 55 uses multiple means to address the goal, including increasing dual enrollment, expanding mentoring, increasing financial aid opportunities to keep students engaged, and bringing Tennesseans back into the workforce.

[Tennessee Promise](#) is a last-dollar scholarship and mentoring program that will provide tuition and fees not covered by Pell Grants, the Hope scholarship, or Tennessee Student Assistance Award ([TSAA](#)). It also provides students with an individual mentor throughout their time in the program. Students are required to complete 8 hours of community service per semester, complete the Free Application for Student Aid (FAFSA), and maintain a 2.0 GPA which is considered satisfactory academic progress. The approximate annual cost of the Promise is \$34 million, which will be paid for through the [\\$300 million](#) Tennessee Promise Endowment, funded through a transfer from Tennessee Lottery reserves. The scholarships can be applied at any of the state's 27 Tennessee Colleges of Applied Technology (TCATs), 13 community colleges, or any state independent or 4-year public university offering an associate's degree.

[Tennessee LEAP](#) (Labor Education Alignment Program), established by the legislature in 2013, came as a result of calls from across the state for greater communication between education and industry in order to proactively align the supply of graduates to future industry needs. LEAP has two main components, a \$10 million Skills Gap competition and the creation of a Workforce Subcabinet led by a new Director of Workforce Alignment to review applications for the Skills Gap competition. In order to apply for the Skills Gap grants, a group must create a D55 regional alignment group that will focus on existing best practices and forecasting future regional workforce needs to fund program development or supply necessary equipment.

# State Initiatives to Watch

Many states across the country are replicating the successful models profiled above to create their own initiatives to increase access to educational and workplace opportunities for students. States profiled below have drawn up or recently enacted legislation to increase apprenticeship, internship, and work-based learning opportunities for high school and community college students, and supported dual enrollment affecting students across their state. The following state initiatives are ones to watch in 2014 and beyond:

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## Iowa

While agriculture is a major economic driver in Iowa, Governor Terry Branstad understands that to attract top talent, the state must continue to diversify its economy and provide training opportunities for students. In response, in May 2014, the Governor signed the [Iowa Apprenticeship and Job Training Act](#).<sup>81</sup> This [legislation](#) triples the state's funding for apprenticeship programs and allows students to earn a paycheck while gaining hands-on training. The bill will build on the 662 already-registered apprenticeship programs in the state, which employ over 8,100 apprentices.

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## Georgia

Georgia enacted the [Work Based Learning Act](#) on July 1, 2014. This will increase dual enrollment opportunities for students to earn credits through the Technical College System of Georgia as well as expand work-based learning opportunities for high school students that are linked to their career pathways. The program replaces and improves the Youth Apprenticeship Program by bringing together employers, students, and public schools to produce students with real-world experience.

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## Louisiana

The Superintendent of Education John White proposed the [Jump Start - Career Education](#) program in early 2014. The goal of the program is to enable students to master basic literacy, numeracy, and career readiness skills, while also earning industry certifications that enable them to attain employment in high-wage career sectors. The program promotes collaboration among school districts, colleges, and businesses to provide high school students with access to career courses and workplace experiences, while preparing high schools to help students attain certifications in career fields most likely to lead to high-wage jobs. To ensure that teachers have adequate training for these career and technical courses, the state created the [Jump Start Career Development Fund](#).(CDF) The CDF provides a 6 percent adder to a school district's Minimum Foundation Program (MFP), beginning in the 2014-2015 school year. CDF funds may be used to defray the cost of materials, equipment, and teacher credentialing/training for "technical" CTE courses in high-wage, high-demand job sectors. In addition, the state provides a [Super Summer Institute Training](#) to ensure teachers have the necessary training and credentials in their field, including [certifications such as NCCER](#).

To help school districts and charter schools launch their Jump Start efforts, the [2014-2015 state budget](#) includes about \$7.5 million in supplemental course allocation funds and approximately \$4 million in CDF funds, contingent upon enrollment figures. The state hopes this will have the effect of catalyzing enrollment in CTE courses. In addition

to these funds, approximately \$845,000 in competitive Jump Starting JumpStart grants will be awarded to support two specific innovations: regional workplace experience exchanges, and the promotion of career counseling. Additionally, [legislation](#) signed into law in June 2014 calls for the creation of the Workforce and Innovation for a Stronger Economy (WISE) Fund, which will fund postsecondary programs in high-demand fields through matching contribution from industry partners.

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## North Carolina

In addition to the many initiatives North Carolina has embarked on to increase access to employability skillsets in their high schools and community colleges, there are two new initiatives coming out of the state that deserve future attention. The first is NCWorks Career Pathways, which aims to bridge CTE from high school to community colleges through well-defined pathways. The second initiative addresses the dropping number of apprenticeship opportunities in North Carolina through the promotion of the [Work-Based Learning](#) Toolbox to local industry. The Department of Commerce, public school system, and North Carolina Community College System will work together to promote and find ways to integrate the Toolbox, which includes Registered Apprenticeship, pre-apprenticeship, co-op, paid and unpaid internships, job shadowing, and simulated work centers.

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## Ohio

In an attempt to increase the number of high school students graduating with college credit and boost postsecondary transitions, Ohio's legislature passed House Bill 487, which contains legislation for [College Credit Plus](#). This bill requires all school districts to make opportunities at public colleges and universities available at no cost to students while setting a floor and ceiling for the costs higher-education institutions can charge school districts for dual enrollment. This enables a school or "home" district to retain a portion of state funding to provide services to the student. The goals of the legislation are to enhance opportunities for participation, improve access to dual enrollment opportunities across the state, ensure quality and applicability of courses offered, and improve communication and data collection.

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## Virginia

In July 2014, Governor Terry McAuliffe signed an executive order creating "[The New Virginia Economy](#)." This new workforce initiative will be led by the Secretary of Commerce and Trade, in alignment with Virginia's Workforce Development System, and will focus on four initiatives to increase postsecondary and workforce credentials, better align education options with workforce needs, increase employment opportunities for veterans, and diversify the economy. The first initiative, "Pathway to 50K" sets a target of 50,000 STEM-H credentials, licenses, apprenticeships, and associates degrees that are in demand in Virginia. The second, "Our Patriot Pledge," will partner with 10,000 businesses to create commitments for hiring veterans. "A Diversified Dominion" and "Real-Time Resources" will work to better diversify the state's economy and provide analysis on Virginia's workforce needs through the creation of the Commonwealth Consortium for Advanced Research and Statistics (CCARS). While these new initiatives will take time to establish, the state has put forward timely action plans to get the systems in place in 2015.

# Additional Resources:

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## Programs

[Career Clusters](#) - The National Career Clusters® Framework, developed by The National Association of State Directors of Career Technical Education Consortium (NASDCTEc), provides schools and state systems 16 Career Clusters which represent more than 79 Career Pathways. The Career Clusters give a framework for curriculum design and instruction that help bridge the gap between secondary and postsecondary institutions.

[Career Pathways Initiative](#) and its Community of Practice helps workforce development leaders, practitioners, and policymakers to initiate, increase, or expand state and local career pathways efforts.

[Pathways to Prosperity Network](#) is a network of eight states brought together through a joint effort between Jobs For the Future and Harvard University. The network is building pathways for high school and community college students, with partnership of local industries, with a goal of increasing the number of postsecondary credentials with market value.

[Partnership for 21st Century Skills \(P21\)](#) builds coalitions between the business community, education leaders, and policymakers to ensure students are equipped with the skills they need in the 21st century.

[Project Lead the Way](#) provides STEM programs in the United States by means of high-quality curriculums and teacher professional development to elementary, middle, and high schools across the country. It also provides a network of educators and community partners to share best practices.

[High Schools That Work](#), developed out of the Southern Regional Education Board, provides a framework of goals and key practices aimed at raising student achievement and graduation rates. Out of this initiative grew [Technical Centers That Work](#), which provides tech centers, technology centers, technical centers, career centers and career-technical (CT) centers the tools to implement the curriculum needed to produce high-demand, high-wage graduates.

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## Reports

[CLASP Executive Summary on Career Pathways](#) & [CLASP Career Pathways Framework & Metrics](#) – shows states the necessary details for creating and measuring career pathways

[Department of Education Dual Enrollment Best Practices](#)  
[Joint DOL, ED, HHS, Commerce Report: What Works In Job Training: A Synthesis of the Evidence](#)

Pathway to Prosperity [2013-2014 State Update](#)

[White House Report: Ready to Work: Job-Driven Training and American Opportunity](#)

[Promising Practices in Statewide Articulation and Transfer Systems](#), a joint publication by the Western Interstate Commission for Higher Education and Hezel Associates, highlights state efforts in statewide articulation and transfer.

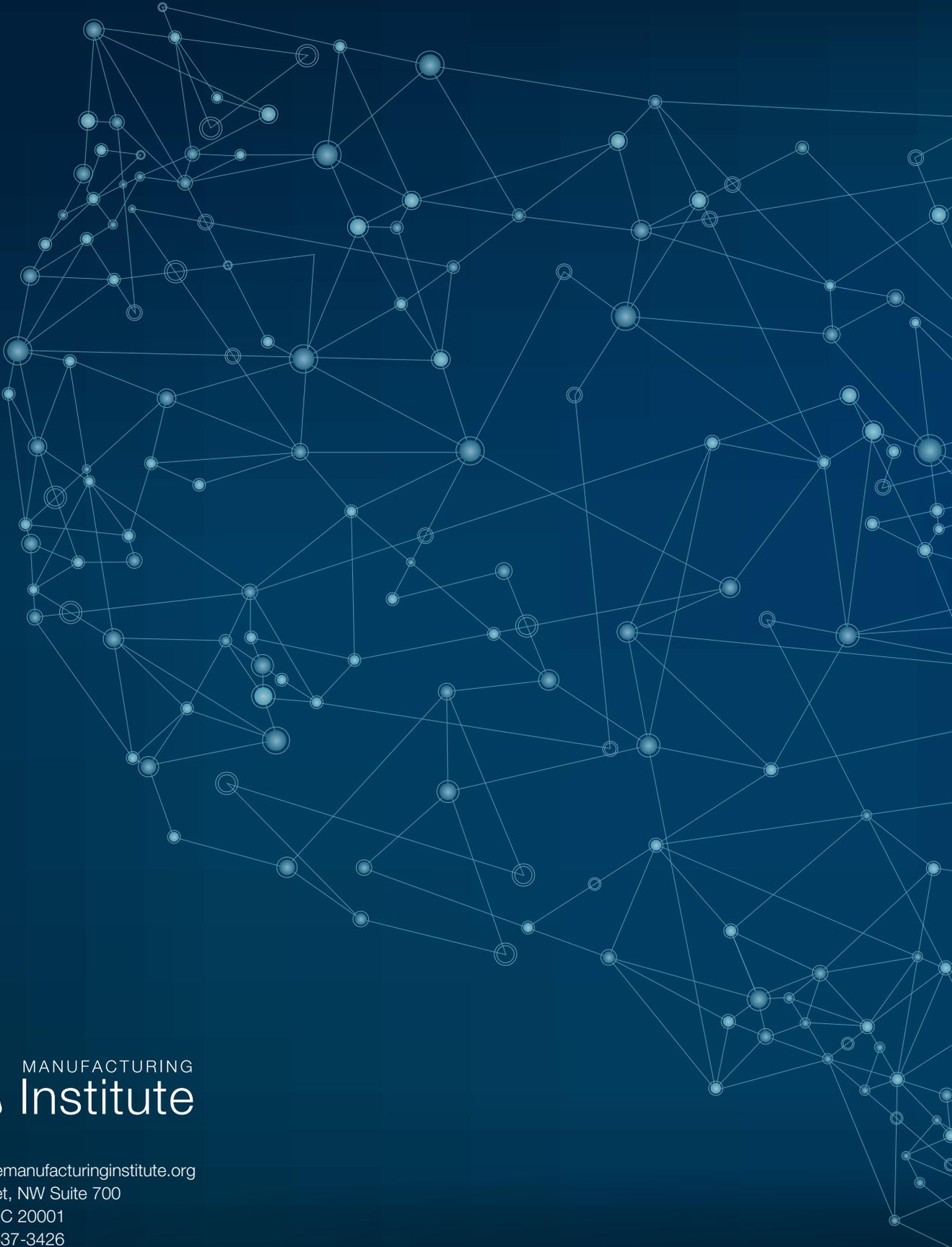
# Endnotes

1. Colorado State Legislature, "The Manufacturing Pathways Act." [http://www.leg.state.co.us/clics/clics2013a/csl.nsf/fsbillcont3/FD81557AE76C4A8F87257AF4007998E9?open&file=1165\\_rer.pdf](http://www.leg.state.co.us/clics/clics2013a/csl.nsf/fsbillcont3/FD81557AE76C4A8F87257AF4007998E9?open&file=1165_rer.pdf)
2. Florida Department of Education, Division of Career and Adult Education, "Florida Career and Professional Education Act." <http://www.fldoe.org/workforce/fcpea/>
3. Florida Department of Education, Division of Career and Adult Education, "Florida Career and Professional Education Act (CAPE): Technical Assistance Paper." <http://www.fldoe.org/workforce/pdf/CAPE-Act-TechAssist.pdf>
4. Florida Department of Education, Division of Career and Adult Education, "Statewide Articulation Agreements – Industry Certification." [http://www.fldoe.org/workforce/dwdframe/artic\\_indcert2aas.asp](http://www.fldoe.org/workforce/dwdframe/artic_indcert2aas.asp)
5. Florida Department of Education, Division of Career and Adult Education, "Gold Standard Articulation Index Quick Reference." <http://www.fldoe.org/workforce/dwdframe/xls/GoldStandardArticulationIndex.xls>
6. Louisiana Office of Financial Assistance, "TOPS Tech Early Start Program." <http://www.osfa.la.gov/TTES.htm>; "Top Demand Occupation": [http://www.osfa.la.gov/MainSitePDFs/Top\\_Demand\\_List.pdf](http://www.osfa.la.gov/MainSitePDFs/Top_Demand_List.pdf)
7. Louisiana Department of Education, "Louisiana Success Through Articulation (STArt): Statewide Secondary to Postsecondary Articulation Agreement (AY 2009-2010)." <http://regents.louisiana.gov/wp-content/uploads/2013/03/STArtMatrices.pdf>
8. Louisiana Legislature, Act No. 174. <http://www.legis.la.gov/Legis/ViewDocument.aspx?d=856960&n=SB93%20Act%20174>
9. Louisiana Department of Education, Louisiana Believes, "Jump Start – Career Education." <https://www.louisianabelieves.com/courses/jump-start-career-education>
10. Louisiana Department of Education, Louisiana Believes, "Jump Start Career Development Fund." <https://www.louisianabelieves.com/courses/career-development-fund>
11. Louisiana Department of Education, Louisiana Believes, "Minimum Foundation Program." <https://www.louisianabelieves.com/funding/minimum-foundation-program>
12. Louisiana Department of Administration, "State Budget: Fiscal Year 2013-2014." [http://www.doa.louisiana.gov/opb/pub/FY14/StateBudget\\_FY14.pdf](http://www.doa.louisiana.gov/opb/pub/FY14/StateBudget_FY14.pdf)
13. Louisiana Legislature, "HB1033." <http://www.legis.la.gov/legis/BillInfo.aspx?s=14RS&b=HB1033&sbi=y>
14. North Carolina Community Colleges, SuccessNC: <http://www.successnc.org/>
15. North Carolina Community Colleges, SuccessNC, "Code Green Super CIP (Curriculum Improvement Project)." <http://www.successnc.org/initiatives/code-green-super-cip-curriculum-improvement-project>
16. California Department of Education, "California Career Pathways Trust." <http://www.cde.ca.gov/fg/fo/profile.asp?id=3505>; California Legislative Information, "Assembly Bill No. 86, Chapter 48" [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB86&search\\_keywords=](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB86&search_keywords=)
17. Indiana Government Press Release, "Governor Mike Pence today hailed the passage of the Indiana Works Councils Bill, SB 465, which passed the House 94-0 this evening." March 23, 2013; Education Commission of the States, "Indiana H.B. 1002: Establishes Indiana Career Council." Signed into law April 1, 2013.
18. Association of Career and Technical Education, "State Profiles: Indiana."
19. Kansas Legislature, "2012 Statute, Article 44 – Career Technical Education." [http://www.kslegislature.org/li\\_2012/b2011\\_12/statute/072\\_000\\_0000\\_chapter/072\\_044\\_0000\\_article/072\\_044\\_0067\\_section/072\\_044\\_0067\\_k/](http://www.kslegislature.org/li_2012/b2011_12/statute/072_000_0000_chapter/072_044_0000_article/072_044_0067_section/072_044_0067_k/)
20. Ohio Higher Ed, University System of Ohio; "Ohio Board of Regents Announces Internship/Co-Op Grant Recipients." [https://www.ohiohighered.org/press/ohio\\_board\\_regents\\_announces\\_internshipco\\_op\\_grant\\_recipients](https://www.ohiohighered.org/press/ohio_board_regents_announces_internshipco_op_grant_recipients)
21. Ohio Higher Ed, University System of Ohio; "Ohio Board of Regents Announces Workforce Development Equipment and Facility Grant Recipients." [https://www.ohiohighered.org/press/ohio\\_board\\_regents\\_announces\\_workforce\\_development\\_equipment\\_and\\_facility\\_grant\\_recipients](https://www.ohiohighered.org/press/ohio_board_regents_announces_workforce_development_equipment_and_facility_grant_recipients)
22. Jobs Ohio. <http://jobs-ohio.com/>
23. Apprenticeship Carolina, SC Technical College; "Youth Apprenticeship Carolina." <http://www.apprenticeshipcarolina.com/YouthApprenticeship.html>; <http://www.apprenticeshipcarolina.com>
24. The White House, "Ready to Work: Job-Driven Training and American Opportunity; p. 13." July 2014. [http://www.whitehouse.gov/sites/default/files/docs/skills\\_report.pdf#Apprenticeship%20Carolina](http://www.whitehouse.gov/sites/default/files/docs/skills_report.pdf#Apprenticeship%20Carolina); Robert Lerman, Brookings Institution; "Expanding Apprenticeship Opportunities in the United States." [http://www.brookings.edu/~media/Research/Files/Papers/2014/06/19\\_hamilton\\_policies\\_addressing\\_poverty/expand\\_apprenticeships\\_united\\_states\\_lerman.pdf](http://www.brookings.edu/~media/Research/Files/Papers/2014/06/19_hamilton_policies_addressing_poverty/expand_apprenticeships_united_states_lerman.pdf)

25. Wisconsin State Legislature, "2013 Wisconsin Act 9." March 13, 2013. <https://docs.legis.wisconsin.gov/2013/related/acts/9>; State of Wisconsin Department of Workforce Development, "Wisconsin Fast Forward: High School Pupil Workforce Training Programs." [http://dwd.wisconsin.gov/wff/prosperity/pupil/blueprint\\_gpa\\_pupil\\_2014.pdf](http://dwd.wisconsin.gov/wff/prosperity/pupil/blueprint_gpa_pupil_2014.pdf)
26. State of Wisconsin Department of Workforce Development, Communications Office; "Blueprint for Prosperity: Governor Scott Walker Announces More Than \$28 Million in Wisconsin Fast Forward Grants to State Technical Colleges." July 17, 2014. [http://dwd.wisconsin.gov/dwd/newsreleases/2014/140717\\_technical\\_colleges\\_grants.htm](http://dwd.wisconsin.gov/dwd/newsreleases/2014/140717_technical_colleges_grants.htm)
27. State of Wisconsin Department of Workforce Development, Wisconsin Fast Forward - Blueprint for Prosperity Initiative High School Pupil Award Summary Executive Summary." [http://dwd.wisconsin.gov/wff/pdf/high\\_school\\_pupil\\_award\\_summary.pdf](http://dwd.wisconsin.gov/wff/pdf/high_school_pupil_award_summary.pdf); State of Wisconsin Department of Workforce Development, High School Pupil Workforce Training Programs Grant Application Frequently Asked Questions." [http://dwd.wisconsin.gov/wff/prosperity/pupil/pupil\\_faq.pdf](http://dwd.wisconsin.gov/wff/prosperity/pupil/pupil_faq.pdf)
28. Pacific Gas & Electric, "About PowerPathway." <http://www.pge.com/en/about/careers/powerpathway/about/index.page?>
29. The White House, "Ready to Work: Job-Driven Training and American Opportunity; p. 15." July 2014. [http://www.whitehouse.gov/sites/default/files/docs/skills\\_report.pdf#%20PG&E%20PowerPathway%20program](http://www.whitehouse.gov/sites/default/files/docs/skills_report.pdf#%20PG&E%20PowerPathway%20program)
30. Kentucky Skills Network, Success Stories; "Bluegrass students find fortune in FAME training program." <http://thinkkentucky.com/workforce/kyFameAMT.aspx>
31. Bluegrass Community & Technical College, "AMT Wins 2013 National Career Pathway Partnership of Excellence Award." [http://bluegrass.kctcs.edu/en/About/Our\\_Campuses/Georgetown/AMC\\_News/October\\_2013.aspx](http://bluegrass.kctcs.edu/en/About/Our_Campuses/Georgetown/AMC_News/October_2013.aspx)
32. Kentucky.gov, Governor Steve Beshear's Communications Office; "Education Gets Historic Lift in Gov. Beshear's Budget." Friday, January 24, 2014. <http://migration.kentucky.gov/newsroom/governor/20140122budget.htm>
33. North Dakota Chamber of Commerce, "Operation Intern: About." <http://operationintern.com/v1/about/>
34. Colorado Community College System, "Colorado Advanced Credit Pathways (ACP)." <http://www.coloradostateplan.com/acp.htm>
35. Colorado Career and Technical Education, "Course Building Standards." <http://cocteststandards.cccs.edu/default.aspx>
36. Colorado Community College System, "Career and Technical Act (CTA) Frequently Asked Questions." [http://www.coloradostateplan.com/CTA\\_faq.htm](http://www.coloradostateplan.com/CTA_faq.htm)
37. Colorado Department of Higher Education, "Guaranteed Transfer and Guided Pathways." <http://highered.colorado.gov/Academics/Transfers/Students.html>.
38. Missouri Department of Higher Education, "Credit Transfer Guidelines for Student Transfer and Articulation Among MO Colleges and Universities." <http://dhe.mo.gov/files/policies/creditransfer.pdf>
39. Governor Jay Nixon, "Fiscal Year 2015: Missouri Budget & Legislative Priorities." [http://content.oa.mo.gov/sites/default/files/FY\\_2015\\_Budget\\_and\\_Legislative\\_Priorities.pdf](http://content.oa.mo.gov/sites/default/files/FY_2015_Budget_and_Legislative_Priorities.pdf); ACT Work Ready Communities, "Missouri." <http://workreadycommunities.org/MO>
40. Office of Missouri Governor Jay Nixon, News; "Gov. Nixon outlines plans and new funding to improve educational opportunities for Missouri's students during visit to Hosea Elementary School in St. Joseph." February 5, 2013. <http://governor.mo.gov/news/archive/gov-nixon-outlines-plans-and-new-funding-improve-educational-opportunities-missouris>; Missouri Department of Higher Education, "A+ Scholarship Program." <http://dhe.mo.gov/ppc/grants/aplusscholarship.php>
41. Education Commission of the States, "Missouri S.B. 381, Education Campus Fund." <http://www.ecs.org/ecs/ecscat.nsf/57f3e2d9a671cf028725698500716e9c/3f9c10ac0348d9cc87257b7900504b38?OpenDocument>; Office of Missouri Governor Jay Nixon, News; "Gov. Nixon announces nearly \$9 million in Missouri Innovation Campus grants to create a pathway for students to careers in high-demand fields." <http://governor.mo.gov/news/archive/gov-nixon-announces-nearly-9-million-missouri-innovation-campus-grants-create-pathway-0>
42. University of Central Missouri, "President Obama's Visit to UCM." <http://www.ucmo.edu/obama/>
43. Oklahoma State Regents for Higher Education, "Career Tech Cooperative Alliance." <http://www.okhighered.org/alliances/>; Oklahoma Career Tech, "Technology Centers." <http://www.okcareertech.org/technology-centers>
44. The Manufacturing Institute, "The M-List." <http://www.themanufacturinginstitute.org/Skills-Certification/M-List/M-List.aspx>; Oklahoma State Regents for Higher Education, "Career Tech Cooperative Alliance." <http://www.okhighered.org/alliances/>
45. Oklahoma State Regents for Higher Education, "Extrainstitutional Learning." <http://www.okhighered.org/current-college-students/extra-learning.shtml>

46. Oklahoma Department of Career and Technology Education, "Consolidated Annual Performance, Accountability, and Financial Status Report for the Carl D. Perkins Career and Technical Education Act of 2006." April 2013.
47. Washington State Board for Community & Technical Colleges, "I-BEST is Integrated Basic Education and Skills Training." [http://www.sbctc.ctc.edu/college/e\\_integratedbasiceducationandskillstraining.aspx](http://www.sbctc.ctc.edu/college/e_integratedbasiceducationandskillstraining.aspx)
48. Washington State Board for Community & Technical Colleges, "Washington's Community and Technical Colleges Integrated Basic Education and Skills Training (I-BEST) One-Pager." [http://www.sbctc.ctc.edu/college/abepds/WEB\\_IBESTone-pager\\_11.5.12.pdf](http://www.sbctc.ctc.edu/college/abepds/WEB_IBESTone-pager_11.5.12.pdf)
49. Georgia West Stacey, "Dual Enrollment Not Just for High Achievers: Early College Improves Outcomes for Disadvantaged Students, Study Finds." Community College Research Center, Columbia University Teachers College; New York: 2012.
50. Golann, J.W. and Hughes, K.L. "Dual Enrollment Policies and Practice: Earning College Credit in California High Schools." Insight, San Francisco: James Irvine Foundation: August, 2008.
51. Karp M.M., Caicagno, J.C., Hughes, L.H., Jeong, D.W. and Bailey, T.R., "The Postsecondary Achievement of Participants in Dual Enrollment: An Analysis of Student Outcomes in Two States." National Research Center for Career and Technical Education, University of Minnesota: 2007.
52. Cassidy, L., Keating, K. and Young, V., "Dual Enrollment: Lessons Learned on School Level Implementation." SRI International. <http://www2.ed.gov/programs/slcp/finaldual.pdf>
53. Kansas Office of the Governor, "2014 State of the State of Kansas." January 15, 2014. <https://governor.ks.gov/media-room/media-releases/2014/01/16/2014-state-of-the-state-of-kansas>; Kansas State Department of Education, "Senate Bill 155." <http://www.ksde.org/Agency/DivisionofLearningServices/CareerStandardsandAssessmentServices/CSASHome/CareerTechnicalEducation%28CTE%29/Initiatives/SenateBill155.aspx>
54. Kansas Legislature, "Career Technical Education for Secondary Students; Technical College Boards; At-Risk Students; High-Density At-Risk Pupil Weighting; SB 155." [http://www.kslegislature.org/li\\_2012/b2011\\_12/measures/documents/summary\\_sb\\_155\\_2012.pdf](http://www.kslegislature.org/li_2012/b2011_12/measures/documents/summary_sb_155_2012.pdf)
55. Association for Career and Technical Education, "State Profiles: Kansas"
56. Kansas Works: "About: Kansas WORKReady!" [https://www.kansasworks.com/ada/skillmatch/skl\\_WorkReadyOverview.cfm](https://www.kansasworks.com/ada/skillmatch/skl_WorkReadyOverview.cfm)
57. North Carolina Community Colleges, SuccessNC: <http://www.successnc.org/>; North Carolina Community Colleges, SuccessNC, "Career & College Promise." <http://www.successnc.org/initiatives/career-college-promise-0>
58. Cape Fear Community College, "Cooperative Innovative High Schools." <http://cfcc.edu/ccp/innovative-high-schools/>
59. Wisconsin State Legislature, "2013 Wisconsin Act 59." <https://docs.legis.wisconsin.gov/2013/related/acts/59>; Wisconsin Department of Public Instruction, "CTE Incentive Grants." [http://cte.dpi.wi.gov/cte\\_technical-incentive-grants](http://cte.dpi.wi.gov/cte_technical-incentive-grants), Wisconsin Department of Public Instruction, "CTE Incentive Grant Certificate List." [http://cte.dpi.wi.gov/files/cte/pdf/approved\\_dpi\\_certifications\\_list\\_05-07-14\\_sw.pdf](http://cte.dpi.wi.gov/files/cte/pdf/approved_dpi_certifications_list_05-07-14_sw.pdf)
60. Wisconsin Department of Public Instruction, "2013 Wisconsin Act 59 Career & Technical Education Technical Incentive Grants Frequently Asked Questions." <http://cte.dpi.wi.gov/files/cte/pdf/tigfaq.pdf>
61. Manufacturing Day, <http://www.mfgday.com/>; Wisconsin Manufacturing & Commerce, "Manufacturing Month." <https://www.wmc.org/programs/manufacturing-month/>
62. Florida Department of Education, "College Success Academy District Information." <http://www.fldoe.org/schools/pdf/CollegeSuccessAcademyDistrictInformation.pdf>
63. Illinois Pathways, "STEM Learning Exchanges." [http://www.ilpathways.com/Pages/Learning\\_Exchanges.aspx](http://www.ilpathways.com/Pages/Learning_Exchanges.aspx); Illinois Pathways, <http://www.ilpathways.com/Pages/Home.aspx>
64. National Association of State Directors of Career Technical Education Consortium (NASDCTEc), "Career Clusters." <http://www.careertech.org/career-clusters>
65. Illinois Pathways Governance Model, <http://www.ilpathways.com/Slider%20Images/IllinoisPathwaysGovernanceModelGraphic.jpg>
66. Pathways to Prosperity Network, "The Pathways to Prosperity Network: A State Progress Report, 2012-2014." <http://www.jff.org/sites/default/files/publications/materials/Pathways-to-Prosperity-for-Americas-youth-080514.pdf>; Illinois Pathways, "Systematic Funding Model," <http://www.ilpathways.com/Slider%20Images/IllinoisPathwaysSystemicFundingModelGraphic.jpg>
67. Jobs for the Future, "Pathways to Prosperity Network." <http://www.jff.org/initiatives/pathways-prosperity-network>; NASDCTEc "Career Clusters." <http://www.careertech.org/career-clusters>; Lumina Foundation, "Goal 2025." [http://www.luminafoundation.org/goal\\_2025.html](http://www.luminafoundation.org/goal_2025.html)

68. Drive to 55 Alliance, <http://driveto55.org/>
69. Drive to 55 Alliance, "Tennessee Reconnect." <http://driveto55.org/initiatives/tennessee-reconnect/>
70. Drive to 55 Alliance, "Tennessee Promise." <http://driveto55.org/initiatives/tennessee-promise/>; Tennessee Student Assistance Corporation, "Tennessee Student Assistance Awards." [http://www.tn.gov/collegepays/mon\\_college/tsa\\_award.htm](http://www.tn.gov/collegepays/mon_college/tsa_award.htm)
71. Golins, Pam; "Tennessee Promise Bill Uses Lottery Funds to Cover Postsecondary Tuition." The Council of State Governments Knowledge Center, <http://knowledgecenter.csg.org/kc/content/tennessee-promise-bill-uses-lottery-funds-cover-postsecondary-tuition>
72. Inside Higher Education, "Tennessee Promise Frequently Asked Questions." [http://www.insidehighered.com/sites/default/server\\_files/files/TN\\_Promise\\_FAQ.pdf](http://www.insidehighered.com/sites/default/server_files/files/TN_Promise_FAQ.pdf)
73. Drive to 55 Alliance, "Tennessee LEAP." <http://driveto55.org/initiatives/tennessee-leap/>
74. Oregon University System, "From goal to reality: 40-40-20." <http://www.oregon.gov/gov/oeib/docs/nnousreport.pdf>
75. Oregon Live, "2011 Session: Senate Bill 253." <http://gov.oregonlive.com/bill/2011/SB253/>; Oregon Legislative Information System, "House Bill 4058." <https://olis.leg.state.or.us/liz/2014R1/Measures/Text/HB4058/Enrolled>
76. Oregon Live, "2011 Session: Senate Bill 909." <http://gov.oregonlive.com/bill/2011/SB909/>; Oregon Department of Education, "Refining 40-40-20: Suggestions for Moving Forward." [http://education.oregon.gov/Documents/HECC/January\\_9,\\_2014/3.2\\_Refining\\_40-40-20.pdf](http://education.oregon.gov/Documents/HECC/January_9,_2014/3.2_Refining_40-40-20.pdf)
77. Oregon Legislative Information System, "House Bill 2689." <https://olis.leg.state.or.us/liz/2013R1/Measures/Text/HB2689/Enrolled>; Oregon Legislative Information System, "House Bill 3232." <https://olis.leg.state.or.us/liz/2013R1/Measures/Text/HB3232/Enrolled>; Oregon Education Investment Board, "OEIB Initiative: Connecting to the World of Work." <http://cms.oregon.egov.com/gov/docs/OEIB/ConnectingWorldWork.pdf>; Oregon Legislative Information System, "2013 Regular Session, HB 2958 B." <https://olis.leg.state.or.us/liz/2013R1/Measures/Overview/HB2958>
78. Oregon Live, "2013 Session: Senate Bill 222." <http://gov.oregonlive.com/bill/2013/SB222/>; Oregon Legislative Information System, "House Bill 2689 A," <https://olis.leg.state.or.us/liz/2013R1/Measures/Text/HB2689/Enrolled>; Oregon Legislative Information System, "2013 Regular Session, HB 2970 A." <https://olis.leg.state.or.us/liz/2013R1/Measures/Overview/HB2970>.
79. Oregon Department of Education, "CTE Revitalization Grant." <http://www.ode.state.or.us/search/page/?id=3389>; TechAmerica, Press Center, "Oregon STEM Investment Council Bill Passes Legislature." <http://www.techamerica.org/oregon-stem-investment-council-bill-passes-legislature/>; Oregon Live, "2013 Session: House Bill 2636." <http://gov.oregonlive.com/bill/2013/HB2636/>
80. Oregon Live, "2013 Session: House Bill 2912." <http://gov.oregonlive.com/bill/2013/HB2912/>
81. Office of the Governor of Iowa Terry Branstad, Branstad signs the Iowa Apprenticeship and Job Training Act into law
82. The Iowa Legislature Bill Book, "House File 2460." <http://coolice.legis.iowa.gov/CoolICE/default.asp?Category=billinfo&Service=Billbook&menu=false&ga=85&hbill=HF2460>
83. Georgia Association of Educators, "HB 766 Work Based Learning Act." <http://pv.gae2.org/content.asp?ContentId=4017>
84. Public Schools of North Carolina State Board of Education, "Career & Technical Education: Work-Based Learning." <http://www.ncpublicschools.org/cte/curriculum/work-based/>
85. Ohio Higher Ed, "College Credit Plus." [https://www.ohiohighered.org/college\\_credit\\_plus](https://www.ohiohighered.org/college_credit_plus)
86. Office of Governor Terry McAuliffe, "Governor McAuliffe Unveils Major Workforce Development Initiative." <https://governor.virginia.gov/newsroom/newsarticle?articleId=5787>



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