

SREB

Credentials for All: An Imperative for SREB States

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The Report of the SREB Commission on Career and Technical Education

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A Message from Governor Beshear

In the SREB region, each of our states has its own character, our economies as different as our landscapes and our dialects. But we share a common problem: Too few students graduate from high school with the academic, technical and workplace knowledge and skills they need to find employment in the key industries that are critical to our states' economies. One of my goals as chair of SREB and its Commission on Career and Technical Education is to promote policies and practices to support strong career pathways that help more students earn industry and postsecondary credentials and obtain good jobs.

This report makes it clear that preparing for today's workplace requires a transformation of our educational system. Over the next decade, we must double the number of young adults who earn credible advanced credentials or degrees by age 25.

By creating high-quality career pathways in our states, we can ensure that our region's young adults are fully prepared for today's knowledge-based economy.



Steve Beshear, Governor,
Commonwealth of Kentucky
Chair, Southern Regional
Education Board
Chair, SREB Commission on
Career and Technical Education

The Southern Regional Education Board is a nonprofit, nonpartisan organization based in Atlanta that works with state leaders and educators to improve education. SREB was created in 1948 by Southern governors and legislators to help leaders in education and government work cooperatively to advance education and improve the social and economic life of the region. SREB's 16 member states are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia. For more information, visit SREB.org.

This report was developed by Gene Bottoms, SREB senior vice president, and Kirsten Sundell, special assistant to the senior vice president, in consultation with Commission members and other SREB staff.

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Executive Summary

The challenge: How do we help more young people earn the postsecondary credentials and degrees that matter in today's economy?

SREB states and the nation are gaining ground on high school graduation rates. Eighty percent of American students now graduate on time from high school — continuing a decade of steady progress.¹

However, the future looks bleak for young people with a high school diploma or less and no postsecondary credential of value in the workplace. The number of jobs available to those with a high school diploma or less has steadily declined for decades, and the Great Recession hit these individuals hard,⁴ particularly in SREB states.⁵ Workers with a high school diploma or less continue to lose jobs despite the economic recovery.⁶

For young people born into poverty, educational attainment may offer the only means of moving up the economic ladder. Research shows that 42 percent of young people born to families in the lowest fifth of income distribution will remain there⁷ — a considerably higher percentage than countries like Great Britain (about 30 percent) or northern European countries like Denmark, Finland and Sweden (about 15 percent).⁸ Even youth born to middle-income families are as likely to move down the economic ladder as they are to move up.⁹

The future looks brighter for young people with the right postsecondary credentials. Higher education attainment of any kind benefits individuals in the labor market. Post-recession, jobs for those with bachelor's degrees have increased, and jobs for workers with some college or a postsecondary credential have mostly recovered.¹⁰

But not enough students are earning postsecondary credentials and degrees. As Table 1 shows, between 55 percent and 73 percent of adults aged 25 to 64 in SREB states had less than a postsecondary credential in 2012. And although about two-thirds of high school graduates immediately enroll in some form of postsecondary education, too few complete a useful credential.¹¹ As of 2012, the three-year graduation rate for first-time, full-time certificate or associate degree-seeking students fell shy of 20 percent; the six-year graduation rate for first-time, full-time bachelor's-seeking students was about 57 percent.¹² SREB's analyses of educational attainment

Employment in the New Economy

In the 21st-century U.S. economy, nearly two-thirds of all jobs require education and training beyond high school. One growing sector is jobs that pay between \$35,000 and \$75,000 a year² in fields such as advanced manufacturing, energy, health care, information technology, and science, technology, engineering and mathematics (STEM).³ To secure these jobs, individuals need to know how to analyze data, apply math, use technology, think critically and solve problems — skills students can develop in high schools, work-based training programs, community and technical colleges, and universities.

TABLE 1:
Percentage of Adults Aged 25-64 by Educational Attainment, SREB States — 2012

State	No high school credential	High school but no post-sec. credential	Some postsec. but no credential	Total: Less than a postsec. credential	Postsec. credential
Alabama	15	30	23	68	32
Arkansas	14	34	23	71	29
Delaware	10	31	21	62	38
Florida	12	29	22	63	37
Georgia	13	28	22	63	37
Kentucky	13	34	22	69	31
Louisiana	15	34	22	71	29
Maryland	9	25	21	55	45
Mississippi	16	30	24	70	30
North Carolina	13	26	23	62	38
Oklahoma	12	31	24	67	33
South Carolina	13	30	22	65	35
Tennessee	13	33	22	68	32
Texas	18	25	23	66	34
Virginia	10	24	21	55	45
West Virginia	13	40	20	73	27

Source: U.S. Census Bureau.

data suggest that at least half of all students entering ninth grade will fail to earn a credible industry or postsecondary credential or degree by age 25.

Low educational attainment harms individuals and the economy.

At current rates of attainment, by 2020 the United States will fall 5 million workers short of industry demand for employees with some postsecondary education.¹³ Despite this substantial workforce gap, joblessness is persistently high, especially for minorities. According to U.S. Department of Labor data for adults aged 20 to 24 who were looking for work in 2013, unemployment was more than 11 percent for white young adults, almost 13 percent for Hispanic young adults and nearly 23 percent for black young adults.¹⁴ The economic outlook for young men is also poor. The age at which young men can expect to reach the median wage has shifted dramatically. In 1980, it was age 26; in 2010, it was age 30.¹⁵

"The new forgotten half [are] those youth who do not complete college and find themselves shut out of good jobs in the era of college for all... Many youth who took society's advice to attend college, sacrificing time and often incurring debts, have nothing to show for their efforts in terms of credentials, employment, or earnings."

— William T. Grant Foundation¹⁶

Not enough students are earning credentials and degrees in the right fields for today's economy. Many believe that a bachelor's degree, regardless of major, is the best guarantee of a well-paying job. Yet after taking on debt, some recent college graduates find themselves with no work. As of 2012, the average unemployment rate for recent college graduates ages 22 to 26 with a bachelor's degree was 7.5 percent.¹⁷ And according to one estimate, as many as 23 percent of recent college graduates may be underemployed, working in a job that requires less than a college degree.¹⁸

Overall, SREB's analyses of educational and labor market data suggest that for many young adults, the 20s are a lost decade. After years of underemployment or unemployment, many return to school when they are nearly 30.¹⁹

Simply put, the bridge from high school to postsecondary attainment and career opportunities is broken. To solve this problem, more high school students must get into community and technical colleges — and on pathways to postsecondary attainment and career advancement — much sooner.

The challenge: How do we provide more young people with an education that connects the classroom with the workplace and prepares them to succeed in postsecondary education and 21st-century careers?

The solution:

- **Transform education with rigorous, relevant career pathways that align secondary, postsecondary and workplace learning and lead to postsecondary credentials that help individuals secure good jobs.**
- **Double the percentage of young adults who earn postsecondary credentials by age 25 over the next decade.** These credentials include advanced industry credentials and postsecondary certificates and degrees at the associate degree level or higher.

Members of SREB's Commission on Career and Technical Education agree that career pathways can help states meet four key performance goals:

- **College and Career Readiness** — Increase the percentage of students who leave high school academically prepared for college and careers to 80 percent or higher. Too few SREB states define college and career readiness in policy or establish readiness measures related to career pathways in their accountability systems. Actions 1, 2, 3, 4 and 8 outline policies and practices states can take to define, measure and enhance student readiness.

- **High School Graduation** — Raise high school graduation rates to 90 percent or higher in all high schools within a decade, and help schools with graduation rates of 70 percent or lower raise their graduation rates to 80 percent or higher within five years. Although graduation rates in SREB states have caught up to the national average, too many students are being left behind — especially in low-performing schools, the subject of Action 5.
- **Workplace Learning Experiences** — Expand the number of secondary and postsecondary students who participate in progressively intensive employer-sponsored work-based learning experiences like job shadowing, paid and unpaid internships, apprenticeships, and learn-and-earn programs. Actions 1 and 8 offer strategies for making employers full partners in education and increasing their investment in work-based learning.
- **Postsecondary Attainment and Career Advancement** — Increase the percentage of high school graduates who immediately enter some form of postsecondary education, including employer-sponsored work-based training programs. Double the percentage of young people who complete advanced industry credentials and postsecondary credentials and degrees and secure high-skill, high-wage, high-demand jobs by age 25. Actions 1, 3, 6, 7 and 8 describe how community and technical colleges and employers can partner with school districts to help more students earn the credentials they need to secure good jobs.

Double the percentage of young adults who earn advanced industry and postsecondary credentials and degrees by age 25.

Commission members agree that rigorous, relevant career pathways:

- Teach college-ready academics, technical skills and workplace know-how in the context of broad career fields in high school and teach more specialized skills at the postsecondary level.
- Align with state and regional labor market opportunities because states and school districts work with business, industry, K-12 and postsecondary partners to design and build pathways.
- Help students understand 21st-century careers, use what they learn in the classroom to solve real-world problems and acquire a broad range of skills through real workplace experiences.
- Attract students of all levels of achievement and educational and career aspirations and prepare them with foundational skills for many career fields.
- Support students with strong career guidance that shows them the many routes to further education, training and fulfilling careers.
- Put high school students on the fast track to earning industry and postsecondary credentials.

What are career pathways?

The terms *career pathways* and *programs of study*²⁰ refer to aligned sequences of academic and technical courses that span high school and postsecondary education and lead to certificates, credentials, degrees and jobs in high-demand fields. The National Association of State Directors of Career Technical Education Consortium (NASDCTEc) outlines over 79 pathways in 16 Career Clusters®.²¹ The term *career pathways* can also refer to initiatives targeting adult learners that span postsecondary education, adult basic education, job training, workforce development, and health and human services.²²

Commission members offer eight actions states can take to build rigorous, relevant career pathways.

These eight actions — supported by a set of policies and practices summarized below and described at length in the full report — can help states double the percentage of young adults earning valuable industry and postsecondary credentials and meet the four key performance goals outlined above.

ACTION 1 — Build bridges from high school to postsecondary education and the workplace by creating rigorous, relevant career pathways driven by labor market demand. Such pathways:

- A. Combine a college-ready academic core with challenging technical studies and require students to complete real-world assignments.**

Require all students to complete a college-ready academic core and a concentration — for example, a four-course career pathway or a set of Advanced Placement or International Baccalaureate courses — that provide the foundational learning skills they need to earn credentials and secure good jobs.

- B. Align three stages of learning — secondary, postsecondary and the workplace — through strategies like dual enrollment and work-based learning.**

Leverage state and federal funds to incentivize school districts, community and technical colleges, and employers to develop career pathways that align with identified workforce needs in key state and regional industry sectors.

Promote structured dual enrollment programs for career pathways and establish uniform statewide policies so students can earn credits toward high school graduation that are automatically added to students' transcripts at community and technical colleges.

Incentivize industry partners to expand ongoing, structured, progressively intensive work-based learning that engages students in authentic applications of academic, technical and workplace skills.

Develop policies with insurers, workforce commissions and other agencies to protect students and their employers in work-based learning experiences.

- C. Create guidance systems that include career information, exploration and advisement and engage students in ongoing career and college counseling beginning in the middle grades.**

Mandate career exploration courses and activities in the middle grades and high school and adopt distributed, curriculum-based career guidance systems that make career and college counseling the shared responsibility of every adult in the school.

- D. Allow students to choose accelerated learning options in settings that provide the extended time needed to earn advanced industry credentials.**

Encourage school districts to offer career pathways in diverse settings — comprehensive high schools, shared-time technology centers, full-time technical high schools, early college high schools, career academies, and community and technical colleges — that allow students to earn advanced credentials and college credits while still participating in activities at their home high schools.

Incentivize districts, technology centers, and community and technical colleges to partner to create early advanced credential programs modeled after early college high schools. Early advanced credential programs allow students to graduate with a diploma plus an advanced industry certification, postsecondary credential or significant credits toward an associate degree.

- E. Lead to further education and training and high-skill, high-wage jobs in high-demand industries.**

Prioritize the investment of state and federal funds to develop rigorous, relevant career pathways that lead to employment in state and regional industry sectors with a shortage of skilled workers.



Royce West, Texas State Senator

ACTION 2 — Expect all students to graduate academically ready for both college and careers.

Establish literacy- and math-readiness standards for non-STEM college majors and set benchmark cut scores on the assessments chosen to measure college readiness.

Collaborate with secondary, postsecondary and industry partners to establish foundational literacy and math readiness standards needed for advanced education and training, non-degree programs and the workplace. Establish cut scores for academic career readiness on multiple validated assessments (such as nationally normed assessments) that predict success in advanced training programs.

Use state-approved junior-year academic readiness assessments as a measure of students' academic preparedness for college and advanced training programs. Work with community and technical colleges to adopt or develop senior-year transitional readiness courses in literacy and math that count as fourth English or math credits.

ACTION 3 — Select assessments of technical and workplace readiness standards that offer long-term value to individual students, employers and the economy; carry college credits; and are directly linked to more advanced certifications and further study.

Define technical career readiness in state policy, capturing the knowledge and skills students must master to enter postsecondary education and training programs and secure high-skill, high-wage jobs in high-demand fields.

Designate a state agency to work with secondary and postsecondary education agencies and employers to identify, evaluate and approve industry certification examinations, technical skills assessments, dual credit courses and end-of-course assessments that are part of a system of stackable credentials.

ACTION 4 — Provide all high school career pathway teachers, especially new teachers from industry, with the professional development and fast-track induction programs they need to meet high academic, technical and pedagogical standards and enhance students' academic and technical readiness for college and careers.

Allocate funds for new teachers from industry to participate in fast-track induction programs that span the first 15 months of teaching and include two weeks to one month of paid employment in the summer before they enter the classroom.

Work with postsecondary and industry partners and external providers to deliver research-based professional development that teaches academic and CTE teachers how to design real-world, project-based instruction, assignments and assessments that integrate literacy, math and science with technical content.

ACTION 5 — Adopt a framework of strategies to restructure low-performing high schools around rigorous, relevant career pathways that accelerate learning and prepare students for postsecondary credentials and degrees.

Use federal, state and local funds to help low-performing high schools reorganize around theme-based career academies that feature rigorous, relevant career pathways.

ACTION 6 — Offer early advanced credential programs in shared-time technology centers, aligning their curricula, instruction and technology with home high schools and community and technical colleges.

Create the time needed for technology center students to earn advanced industry credentials by offering full-time study during students' junior and senior years; extending the school year or the school day; creating 13th-year early advanced credential programs; converting some centers into full-time technical high schools or full-time regional magnets; or partnering with community and technical colleges to offer junior- and senior-year career pathway instruction.

ACTION 7 — Incentivize community and technical colleges and school districts to double the percentage of students who earn certificates, credentials and degrees by setting statewide readiness standards and aligning assessment and placement measures with those standards. Other strategies: Use the senior year of high school to reduce the number of students who need remediation, retool developmental education, adopt individualized support strategies for struggling students and improve affordability.

Use a combination of incentives and performance-based funding models to encourage community and technical colleges to work with school districts to increase the percentage of students who complete their programs and earn industry credentials and postsecondary certificates and degrees.

Increase the number of ways students can qualify for credit-bearing course work and developmental education. Establish multiple measures of postsecondary readiness, such as the grade point average (GPA), benchmark scores on nationally normed assessments and college placement exams.

ACTION 8 — Design accountability systems that recognize and reward districts, high schools, technology centers, and community and technical colleges that double the number of young adults who acquire postsecondary credentials and secure high-skill, high-wage jobs by age 25.

Allocate extra weight in state accountability systems for each high school student who meets both academic college-readiness standards and technical career-readiness standards. Ensure that the state accountability system values academic college readiness and academic and technical career readiness equally.

Allocate extra weight in state accountability systems for each high school student who completes an advanced industry credential in a critical industry sector.

Increase each year the percentage of high school students who demonstrate academic, technical and workplace readiness by:

- a. completing capstone courses, senior portfolios, career and technical student organization competitions, or work-based learning experiences;
- b. attaining advanced industry credentials;
- c. earning dual credits for career pathway courses; and
- d. passing end-of-course assessments for career pathway courses that generate extra weight toward the GPA or carry college credit.



Derrick Graham, State Representative,
Kentucky

Establish a multi-measure, college- and career-ready performance index to assess, track and report progress made by school districts, high schools, community and technical colleges, and employers delivering career pathways. Expect secondary and postsecondary partners to:

- Raise high school graduation rates to 90 percent or higher in all high schools within a decade or less and help schools with graduation rates of 70 percent or less raise their graduation rates to 80 percent or higher within five years.
- Increase the percentage of students who leave high school academically prepared for college and careers to 80 percent or higher.
- Increase each year the percentage of students who meet academic career-readiness benchmarks for the foundational literacy and math skills appropriate to their career pathways.
- Increase each year the percentage of high school students who complete a career pathway consisting of a college-ready academic core and at least four sequential CTE courses leading to further education and training and workforce opportunities.
- Increase each year the percentage of high school graduates who immediately enter some form of postsecondary education, including employer-sponsored work-based training programs.
- Double over the next decade the percentage of young people who complete advanced industry credentials, postsecondary certificates and degrees by age 25.
- Expand each year the number of secondary and postsecondary students who participate in employer-sponsored work-based experiences and learn-and-earn programs.

Credentials for All: An Imperative for SREB States

The Report of the SREB Commission on Career and Technical Education

SREB's Commission on Career and Technical Education challenges states to build bridges from high school to postsecondary attainment and career advancement by developing rigorous, relevant career pathways that align secondary, postsecondary and workplace learning and lead to high-skill, high-wage jobs in high-demand industry sectors.

The eight actions in this report offer states policies and practices to help more young people earn the credentials they need to secure good jobs. Such credentials include advanced industry credentials as well as the full spectrum of postsecondary certificates and associate, bachelor's and graduate degrees.

Action 1 describes five essential elements of high-quality career pathways, while Actions 2 through 8 outline elements that support these pathways. As all eight actions make clear, high-quality career pathways involve far more than a sequence of four career and technical education (CTE) courses. Career pathways transform state education and workforce preparation systems by infusing rigor and relevance into learning and changing the nature of curriculum and instruction at the high school and postsecondary levels. Through these actions, states can achieve these key goals:

- **College and Career Readiness** — *Increase the percentage of students who leave high school academically prepared for college and careers to 80 percent or higher.*
- **High School Graduation** — *Raise high school graduation rates to 90 percent or higher in all high schools within a decade. Help schools with graduation rates of 70 percent or lower raise graduation rates to 80 percent or higher within five years.*
- **Workplace Learning Experiences** — *Expand the number of secondary and postsecondary students participating in progressively intensive, employer-sponsored work-based learning experiences and learn-and-earn programs.*
- **Postsecondary Attainment and Career Advancement** — *Increase the percentage of high school graduates who immediately pursue some form of postsecondary education, including employer-sponsored training programs. Double the percentage of young people who complete advanced industry credentials and postsecondary credentials and degrees and secure high-skill, high-wage, high-demand jobs by age 25.*

Rigorous, relevant career pathways involve far more than just a sequence of four CTE courses.

In a recent PDK/Gallup poll, parents stressed that students need to be prepared for careers and college: 75 percent agree that schools should place more emphasis on preparing students for career fields linked to job opportunities, and two-thirds agree that more emphasis should be placed on preparing all students for college.²³

Eight Actions States Can Take to Build Career Pathways

ACTION 1— Build bridges from high school to postsecondary education and the workplace by creating rigorous, relevant career pathways driven by labor market demand. Such pathways:

- A. Combine a college-ready academic core with challenging technical studies and require students to complete real-world assignments.
- B. Align three stages of learning — secondary, postsecondary and the workplace — through strategies like dual enrollment and work-based learning.
- C. Create guidance systems that include career information, exploration and advisement and engage students in ongoing career and college counseling beginning in the middle grades.
- D. Allow students to choose accelerated learning options in settings that provide the extended time needed to earn advanced industry credentials.
- E. Lead to further education and training and high-skill, high-wage jobs in high-demand industries.

A. Career pathways combine a college-ready academic core with challenging technical studies and require students to complete real-world assignments.

Across the nation and in SREB states, too few students meet academic college- and career-readiness standards. Recent 12th-grade National Assessment of Educational Progress results indicate that only 38 percent of students score at or above Proficient in reading and just 26 percent score at or above Proficient in math.²⁴

Commission members agree that high schools must focus on more than academics to reach graduation rates of 90 percent or higher and college- and career-readiness rates of 80 percent or higher. **High schools must also raise the quality of their career and technical education, which is often not challenging or connected to postsecondary programs and new workforce opportunities.**

Commission members urge states to establish policies that clearly outline a vision of career pathways driven by college- and career-readiness standards. Such pathways must engage students through intellectually demanding, project-based assignments that require the use of academic and technical knowledge and skills and produce products or services of value beyond the classroom.

Project-based learning challenges students to apply academic and technical knowledge to solve real-world problems.²⁵ In a project-based approach, teachers support students as they take greater responsibility for completing assignments. Industry and postsecondary partners can contribute to these assignments.

Rigorous career pathways use project-based assignments to capture students' natural interests and help them make connections between what they learn in school and their future goals. At the same time, they promote deeper learning and increase college and career readiness. In SREB's 2014 High Schools That Work (HSTW) assessment,

Rigorous CTE Assignments Ask Students to:

1. Perform background research for a problem or project, such as reading technical articles, before developing a plan or solution.
2. Predict outcomes based on observations or information provided.
3. Develop a logical argument for the solution to a problem or project.
4. Make inferences from information to develop a solution for a problem or project.
5. Use math to solve complex problems related to a CTE area.
6. Apply academic knowledge and skills to a CTE area.
7. Apply technical knowledge and skills to new situations.
8. Develop and test hypotheses.
9. Complete an extended project that requires planning, developing a solution or product, and presenting results orally or in writing.
10. Use software or other technology related to a CTE area at least weekly to complete assignments.

68 percent of students at high-performing schools reported experiencing assignments featuring five or more of SREB's 10 indicators of rigorous CTE assignments. (See the sidebar). At these schools, 90 percent of students met college- and career-readiness benchmarks. At low-performing schools, only 21 percent of students reported experiencing similar assignments, and only half met college- and career-readiness benchmarks.²⁶ Across HSTW and Technology Centers That Work sites, little more than a third of CTE students report receiving rigorous assignments.

To take career pathways to scale, states must invest in new curricula that blend college-ready academics with challenging technical studies and provide a framework for creating rigorous assignments.

SREB's new **Advanced Career** curricula take this approach. **Alabama, Arkansas, Kentucky, New Jersey, North Carolina, Ohio, South Carolina, Texas and West Virginia** are working with SREB to develop career pathways in advanced manufacturing, aerospace engineering, clean energy technology, energy and power, global logistics, health informatics, informatics, oil and gas, and STEM. Designed in partnership with secondary, postsecondary and industry experts, each pathway includes four courses built around challenging projects that incorporate rigorous academic and technical knowledge and encourage students to explore careers. English, math and science teachers share professional development with Advanced Career teachers. These teacher teams meet during common planning times to determine how to support students as they acquire the literacy, math, and science knowledge and skills they must apply to complete project-based assignments. Principals look for evidence during classroom observations that lessons connect academics with Advanced Career projects.

More Actions States Can Take to Combine College-Ready Academics and Challenging Technical Studies

Require all students to complete a college-ready academic core and a concentration — for example, a four-course career pathway or a set of Advanced Placement (AP) or International Baccalaureate (IB) courses — that provide the foundational learning skills they need to earn credentials and secure good jobs.

- Require all students to take four years of math before graduation — Algebra I and geometry plus two years of math related to their career pathways. Require students who plan to pursue advanced industry credentials and postsecondary degrees in STEM fields to follow an advanced math pathway that includes Algebra II and higher math.

Provide professional development to academic and CTE teachers and administrators on how to design project-based assignments that blend academic and technical knowledge and skills and relate to students' career pathways.
(See Action 4 for more on the professional development needs of teachers and administrators.)

- Involve industry and postsecondary partners in designing and aligning assignments with industry, postsecondary, and college- and career-readiness standards.
- Work with postsecondary partners to determine which career pathway courses have assignments that are rigorous enough to carry college credit or extra weight toward the GPA, as do many AP, IB and honors courses.
- Use local, state and federal funds to develop an online repository of field-tested assignments.
- Commission annual benchmarking studies that assess a random selection of assignments and use the results to showcase exemplary work and inform future professional development.

FIGURE 1:
The SREB *Advanced Career Approach to Career Pathways*



Develop and use appropriate classroom assessment measures (such as HSTW Student Survey indices, which have been shown to be highly predictive of student achievement) to capture the quality and rigor of curricula, instruction, work experiences and assignments in academic and career pathway courses.

B. Career pathways align three stages of learning — secondary, postsecondary and the workplace — through strategies like dual enrollment and work-based learning.

The 21st-century economy calls for millions more workers with advanced credentials.²⁷ By doubling the percentage of young people who earn credentials in high-demand fields, states will significantly increase the percentage of graduates who enter community and technical colleges immediately after high school. Community and technical colleges offer quick and affordable routes to credentials and degrees.

Most high schools and community and technical colleges operate without interacting meaningfully with each other, in part due to their separate funding and governance structures. Commission members agree that states should use funding and accountability systems to incentivize districts, high schools and community colleges to use strategies like dual enrollment and work-based learning to align their curricula and instruction.

Through highly structured **dual enrollment programs**,²⁸ students can earn college credits that transfer across state postsecondary institutions, save money and shorten time to a certificate, credential or degree.²⁹ High school juniors and seniors in **North Carolina's** Career & College Promise program³⁰ earn college credits leading to postsecondary credentials and high-wage jobs through defined pathways. The Career & College Promise program has three components: a *college transfer pathway* for students headed to four-year institutions, a series of *career pathways* leading to community college programs and an *innovation pathway* for students enrolled in early college high schools. These pathways eliminate unfocused course-taking and lead to postsecondary programs in high-demand fields. High schools and colleges both receive funding for student participation.

Greater employer involvement in education — including increased investment in **work-based learning** — helps more students make good decisions about their career and college options. Beginning in high school, students pair with adult mentors who show them how to solve problems, cultivate soft skills and explore jobs³¹ through structured work-based learning experiences like job shadowing, co-ops, paid and unpaid internships, school-based enterprises and service learning. Work-based learning is a powerful means of socializing students into the world of work. This is particularly valuable for low-income students, who may lack the social capital to learn about many careers. American parents agree that students need these hands-on learning opportunities outside of the school: Two-thirds of parents agree that high school students should complete at least one volunteer experience or paid internship before graduation, according to a recent PDK/Gallup poll.³²



June Atkinson, State Superintendent, Public Schools of North Carolina

Incentives for Secondary, Postsecondary and Industry Partnerships

Many of the policy actions in this report recommend incentives for partners who create career pathways that lead to advanced industry and postsecondary credentials and degrees. Such incentives include:

- Career pathway-related indicators in a college- and career-ready state accountability index
- Competitive state funds for districts, schools and postsecondary institutions that develop, adopt or redesign pathways aligned with workforce needs in key industry sectors
- Tax credits for employers who provide work-based learning for students
- Bonus funds for district and community and technical college partnerships that annually increase the percentage of students who enroll in postsecondary programs immediately after high school and earn advanced credentials by the age of 25
- Bonus funds for districts, schools and teachers who help students acquire advanced industry credentials
- College credits guaranteed to transfer among state postsecondary institutions
- Diploma endorsements for students who complete pathways and earn credentials
- Scholarships for students who, immediately after high school, enroll in postsecondary programs that lead to advanced credentials and jobs in industry sectors with critical workforce gaps

In **California's Linked Learning** high schools, work-based learning bridges classroom instruction and hands-on learning in the workplace. At Palmdale High School, groups of seniors spend three mornings a week at a Kaiser Permanente facility working with real patients, learning how to perform electrocardiograms and evaluating test results. A dedicated physician's assistant works with their teacher. Back in the medical science classroom, students explore the human cardiovascular system, the role that electricity plays in regulating the heart and how disease affects it.

At the postsecondary level, work-based learning experiences like internships and apprenticeships teach students highly specialized technical skills. Through employer-sponsored learn-and-earn programs, states limit the rising cost of postsecondary education while meeting workforce needs in existing or emerging industries.

Use incentives to promote employer investment in career pathways.

Many states offer employers quick-start workforce training programs with customized training solutions. Employer-sponsored learn-and-earn programs at community and technical colleges are another way to create a well-developed pipeline of workers.

The **Advanced Manufacturing Technician program**, originally developed by Toyota in partnership with the **Kentucky Community & Technical College System**, prepares technicians with the academic, technical and workplace skills necessary to succeed in advanced manufacturing careers. The program offers work-based learning experiences in a manufacturing environment. Students learn about safety and lean manufacturing and acquire problem-solving and communication skills. After high school, students finish an associate degree in five semesters while earning up to \$40,000 each year.³³ They work three days a week for Toyota and spend two days engaged in intensive related studies. Those who complete the program are hired at starting salaries of at least \$60,000 a year and can continue their studies at the bachelor's level or higher.

Work-based learning is a smart investment for employers, their current employees and their future workforce. It also offers financial benefits. Some states provide tax credits to encourage participation. **Alabama's House Bill 384** extends state income tax credits of 50 percent to employers who donate to dual enrollment scholarships. Employers can earmark 80 percent of their donations to support training in specific careers. Up to 10 million dollars will help 9,500 students participate in dual enrollment each year.³⁴

More Actions States Can Take to Align Secondary, Postsecondary and Workplace Learning

Leverage state and federal funds to incentivize school districts, community and technical colleges, and employers to develop career pathways that align with workforce needs identified in key state and regional industry sectors. To qualify for incentive funds, secondary and postsecondary agencies must agree on ways to jointly develop and administer these career pathways.³⁵ States that already use tax credits to incentivize business relocation or expansion might consider making work-based learning for high school and postsecondary students a feature of these economic and workforce development initiatives.

Promote structured dual enrollment programs for career pathways and establish uniform statewide policies so students can earn credits toward high school graduation that are automatically added to students' transcripts at community and technical colleges.

West Virginia's Simulated Workplace Initiative

Secondary, postsecondary, industry and workforce development agency partners are helping transform high schools into business environments that blend academic, technical and workplace skills. These programs challenge students to complete projects that offer value to their schools and communities. On the road to earning industry credentials and college credits, students learn how to excel in a business environment. Students are expected to master academic and technical content, complete their assignments, arrive punctually, adhere to company protocols, demonstrate professional ethics, work in teams and provide good customer service. Industry partners assist schools in evaluating program and student success.³⁶

- Under the statewide dual enrollment policy, establish criteria through which state postsecondary institutions can approve curricula, standards, benchmarks, assessments and teacher qualifications for all career pathway dual enrollment courses.
- Create a comprehensive statewide transfer and articulation agreement that is transparent to students, parents, schools and colleges.
- To maximize participation, make dual enrollment free for the student and set flexible eligibility requirements. Offer courses in high schools, community colleges and online.
- Fund high schools, technology centers, and community and technical colleges equitably for students' time in dual enrollment courses.

Incentivize industry partners to expand ongoing, structured, progressively intensive work-based learning that engages students in authentic applications of academic, technical and workplace skills.

- Extend state or local tax credits to employers to cover a portion of student trainee salaries and to cover a portion of the time employers spend training, mentoring or reviewing student assignments. Consider gradually reducing tax credits on a sliding scale over time as student trainees offer greater value to their employers. Ask employers to commit to hiring some proportion of students who complete their training.

Develop policies with insurers, workforce commissions and other agencies to protect students and their employers in work-based learning experiences.

Assign responsibility for coordinating work-based learning at the school district or regional level while leveraging the resources of workforce development agencies, nonprofit organizations or chambers of commerce. Provide districts, community and technical colleges, and employers with adequate resources to ensure broad participation.

C. Career pathways create guidance systems that include career information, exploration and advisement and engage students in ongoing career and college counseling beginning in the middle grades.

As states strive to prepare more college- and career-ready students, they need to promote a full range of pathways to postsecondary attainment and career advancement, including community and technical colleges, technology centers, work-based training programs, apprenticeships and training leading to advanced credentials. Too often, high schools focus only on the four-year college and university option. Yet comparatively few young people — less than 34 percent of those aged 25 to 29³⁷ — hold a baccalaureate or higher, and too many spend their early adult years undereducated and underemployed before enrolling in community and technical colleges in their late 20s.³⁸

Commission members urge states to create **career guidance systems** that transform schools into career-preparatory cultures where all students are ready for a full range of postsecondary options, including four-year institutions, community and technical colleges, technology centers and work-based learn-and-earn programs. To change school cultures, states need to educate students, parents and schools about career pathways and clarify the relationship between education and labor market outcomes. American parents want this information: 89 percent of respondents to a 2014 PDK/Gallup poll agreed or strongly agreed that students need to learn more about possible career choices earlier.³⁹

Protecting Students and Employers in Work-Based Learning

Maryland's workers' compensation system covers students participating in unpaid work-based learning experiences. State law limits employers' liability if a student is injured in an unpaid work-based learning experience.

Kentucky formed an agreement with a temporary employment agency that hires and assumes liability for 16- and 17-year-old participants in paid internships. Businesses pay the employment agency, which in turn pays the students.

Middle grades students should begin exploring jobs and careers, identifying their aptitudes and interests, and setting tentative plans to reach their goals. Career exploration also needs to be the focus of the entire school community. Research shows that a **distributed system of guidance** — one that engages teachers, counselors and other adults, including employers — helps students and parents plan for the future.⁴⁰

As **Ohio's** Career Connections initiative shows, career exploration and counseling activities should include annual revision of individualized graduation plans or individualized learning plans. These organize academic and technical course-taking around students' tentative career aspirations and plans for further education. When grounded in guided workplace experiences, students can make connections between their interests, their work and what they learn in school. Many states also offer websites where students can take interest inventories, investigate colleges and financial aid options and search for career opportunities.

Career exploration courses and career assessments are mandated in some schools' curricula. At **Fort Mill High School in Fort Mill, South Carolina**, ninth-graders take High School 101 (HS101), a required course that helps students identify their talents, interests and goals; acquire learning skills; and create personal plans of study to reach their goals.⁴¹ Since adopting HS101, the school has seen pass rates on both components of the South Carolina High School Assessment Program exam increase, from 81 percent in 2000-01 to over 95 percent in 2012.⁴²

Career and college guidance must be the shared responsibility of every adult in the school.

Other schools, like **Walhalla High School in Walhalla, South Carolina**, developed teacher advisement systems that create and sustain supportive relationships between teachers and students during all four years of high school. Teams of administrators, teachers and counselors evaluate student needs and plan grade-appropriate career exploratory lessons and activities.⁴³

Commission members urge districts, schools, and community and technical colleges to do more to educate students and parents about the advantages of completing career pathways at the postsecondary level — and also about the excellent value community and technical colleges offer. Community and technical colleges can place dedicated staff in high school advising centers to help students, parents and counselors learn more about how college programs lead to career opportunities.

Commission members stress the need to develop **state longitudinal data systems** that link educational, employment and workforce data. Educators and policymakers can use these data not only to develop and align career pathways but also to develop websites that educate students and parents about how career pathways prepare students for success in further education and the workplace. Such data can also inform policymakers, education leaders and employers about program relevance, quality and institutional performance and show the return on investment of education.

Counseling for Careers in Ohio

Ohio's Career Connections initiative takes a comprehensive approach to making education more relevant to students' interests. It engages students in ongoing career exploration and planning from elementary school through high school graduation and beyond. Career Connection Learning Strategies help teachers connect academic knowledge and skills linked to the state's New Learning Standards with real-world jobs. High school students explore education and training options and engage in career-based learning experiences. [OhioMeansJobs.com](#) helps students discover high-demand careers, explore education and training options, prepare job applications and develop college and career plans.

Reaching Out to High School Students

In South Carolina, Midlands Technical College (MTC) formed a partnership with the Fairfield County School District to prepare more students for college and careers. MTC established a Success Center at Fairfield Central High School (FCHS) and placed a college recruiter there to provide counseling and services. At the center, students can learn about financial aid and other aspects of postsecondary education, take college placement tests, get college application help and enroll in dual credit at no cost. Since the initiative's launch, enrollment at MTC by FCHS students increased from two in 2011 to 51 in the fall of 2013.

More Actions States Can Take to Create Career Guidance Systems

Mandate career exploration courses and activities in the middle grades and high school, and adopt distributed, curriculum-based career guidance systems that make career and college counseling the shared responsibility of every adult in the school.

- Offer counselors professional development on how to develop and support teacher advisement systems in which teachers plan lessons that help students understand their career interests, plan their courses and identify a career focus for their postsecondary studies. Allow schools without counselors to designate teachers, with adequate release time, to lead these efforts.
- Require all middle grades schools and high schools to implement career and college guidance plans that include, starting no later than eighth grade, the development of individualized graduation plans or individualized learning plans that align with students' tentative career goals and are revised and reviewed annually by students and parents. Ensure that these plans include a college-ready academic core and allow students interested in more traditional academic studies to concentrate in math, science or the humanities.
- Assign a teacher-adviser to every student and, where possible, ensure that students have the same teacher-adviser throughout all four years of high school. Structure school schedules to allow teachers to plan lessons and meet weekly with their student advisees.
- Develop a repository of grade-appropriate career exploratory lessons and provide teachers and counselors with tools and strategies to help students think about not only choosing a college but also selecting a career focus for their college studies.
- Ensure that guidance systems include experiences that help students understand their interests and aptitudes and explore careers and postsecondary learning opportunities through activities like job shadowing, internships, career research and interviews with adults.
- Support schools that are implementing these guidance systems with grants and technical assistance.

Allocate funds to create and maintain high school career and college advising centers featuring multimedia marketing materials and online resources that counselors, teachers and students can use to explore career pathways and plan for the future.

- Encourage community and technical colleges to staff centers on designated days to provide support to students, parents and school personnel.

Work with industry partners and community and technical colleges to develop multimedia marketing materials and outreach campaigns that educate district and school leaders, teachers, counselors, students and parents about the value of career pathways. Charge state economic and workforce agencies with developing and distributing materials that describe career opportunities in key industries to students, parents and schools. Charge these agencies with conducting educational activities with high school teachers and counselors and community and technical college advisers.



John Legg,
Florida State Senator

Data-Driven Career Pathways

Florida's Economic Security Report⁴⁴ merges student data — including institution, graduation year, degree or certification, and area of study — from the Florida Education and Training Placement Information Program with unemployment insurance wage data, financial aid information and other data, allowing the state to analyze which institutions and programs are best contributing to its workforce needs. The Economic Security Report also powers beyondeducation.org, a website that lets students and parents explore career pathways, see the connections between education and earnings, calculate college costs and investigate the performance of postsecondary institutions.

Tennessee's edutrendstn.com website shows the links among postsecondary certificate, credential and degree programs and the labor market outcomes.

- Encourage community and technical colleges to develop and disseminate materials that illustrate how career pathways at the postsecondary level can save students time and money.

Allocate funds to create career pathway websites featuring tools and materials that help policymakers, administrators, teachers, counselors, students and parents explore:

- job opportunities and earnings associated with career pathways at different levels of preparation and postsecondary attainment.
- skills and competencies required by employers in specific career pathways.
- program completion rates of institutions offering career pathways.
- employers that offer learn-and-earn programs in specific career pathways.
- costs (such as tuition and fees) incurred by students pursuing specific career pathways.

Ensure that the educational and employment data housed in career pathway websites are used not for regulatory purposes but rather as a framework for aligning curricula and instruction with the requirements of broad career fields.

- Use analytic tools that draw on real-time job data to analyze workforce needs and identify the licenses, certificates, credentials and degrees requested by employers.

D. Career pathways allow students to choose accelerated learning options in settings that provide the extended time needed to earn advanced industry credentials.

To achieve high school graduation rates of 90 percent or higher and put more students on accelerated routes to postsecondary attainment and good jobs, states need to create career pathways in settings that blur the lines between secondary and postsecondary education and the workplace.

Rigorous, relevant career pathways blur the lines between secondary and postsecondary education and the workplace.

States can also strengthen career pathways by adopting longer school years or days, block schedules or seven-period days that offer the extended time students need to complete project-based and work-based assignments and earn advanced credentials. Research shows that students benefit when they can take academic and technical classes as a cohort and when academic and CTE teachers have time to integrate their curricula and assignments.⁴⁵

Commission members agree that states must embrace policies that personalize learning and shift the focus from when and where learning takes place to helping more students earn advanced industry credentials and postsecondary certificates and degrees.

States can implement career pathways in such settings as:

- **career academies** located within comprehensive high schools.
- **shared-time technology centers or full-time technical high schools.** (See Action 6.)
- **early college high schools**, in which students can earn a diploma while pursuing a postsecondary certificate, credential or associate degree.
- **online, blended or competency-based programs.**

Virginia's Career Academies

Students in Virginia's career academies earn industry credentials and college credits at the same time. In 22 **Governor's STEM Academies**, students can complete their programs by earning an industry credential or state license, passing a college assessment, acquiring at least nine dual or AP credits, or earning an associate degree. Eight **Governor's Health Sciences Academies** feature work-based learning and pathways in biotechnology research and development, diagnostic services, health informatics, support services and therapeutic services. **Microsoft IT Academies** in 376 high schools and technology centers allow students to earn Microsoft Office and Certiprep certifications at no cost to them.

Career academies increase graduation rates and college and career readiness. Students take classes as a cohort while interdisciplinary teams of teachers integrate instruction and assignments. Career academies also structure learning supports and career development activities. A random assignment study showed that career academies improve students' employment outcomes and help them transition to college and careers, with particular benefits for at-risk students.⁴⁶ Career academies can operate without detracting from a college-preparatory focus.⁴⁷

Early college high schools, often housed on college campuses, help students graduate with enough credits to earn advanced credentials and associate degrees. Students take college courses from college faculty or certified high school teachers. Such programs increase postsecondary readiness and access for first-time college-goers, low-income and minority students, and other underrepresented groups.

North Carolina has the most early college high schools of any state in the nation, having expanded its network from 13 schools in 2005 to 76 in 2014. Some schools' career themes are related to key state industries like health science, information technology and STEM. An ongoing evaluation of more than 2,000 North Carolina early college students found that, compared to their peers, more early college high school students — especially minority students, first-generation college-goers and low-income students — were completing college-preparatory courses, on track for college and graduating.⁴⁸ They were also more likely to earn an associate degree.⁴⁹

Commission members urge states to use early college high schools as models for **early advanced credential programs** that provide the extended learning time students need to graduate with a high school diploma plus an advanced industry credential, postsecondary credential or an associate degree.

Online and blended instruction strategies are learner-centered and accelerate academic and technical readiness outside the traditional classroom and school day. Digital technologies allow for individualized instruction and give students greater control over the pace, time and place of learning. These strategies also expand access to high-quality career pathways in schools that may lack resources or postsecondary and industry partners. Students in competency-based programs earn credits while they demonstrate mastery of academic and technical skills on formative, interim and summative assessments.⁵⁰ For some students, these programs may offer faster, less expensive routes to credentials and degrees.

More Actions States Can Take to Offer Accelerated Learning Options

Encourage school districts to offer career pathways in diverse settings — comprehensive high schools, shared-time technology centers, full-time technical high schools, early college high schools, career academies, and community and technical colleges — that allow students to earn advanced credentials and college credits while still participating in activities at their home high schools.

Incentivize districts, technology centers, and community and technical colleges to partner to create early advanced credential programs modeled after early college high schools that allow students to graduate with a diploma plus an advanced industry certification, postsecondary credential or significant credits toward an associate degree.

- Help students in these programs acquire the foundational literacy and math skills needed to earn advanced industry credentials that carry significant transferrable college credits.
- Encourage flexible school schedules — including 13th-year programs, extended school years or days, block schedules and seven-period days — that provide the intensive related instruction and work-based learning needed to earn advanced credentials.

E. Career pathways lead to further education and training and high-skill, high-wage jobs in high-demand industries.

Commission members urge states to significantly increase the percentage of students who enter postsecondary education immediately after high school graduation and earn valuable credentials by age 25. To meet this goal, states need to invest in career pathways that offer students **clear, easy-to-follow road maps** to advanced industry and postsecondary credentials and degrees and good jobs. States may need to develop new pathway curricula, adopt nationally recognized curricula or redesign existing curricula to meet postsecondary and industry standards.

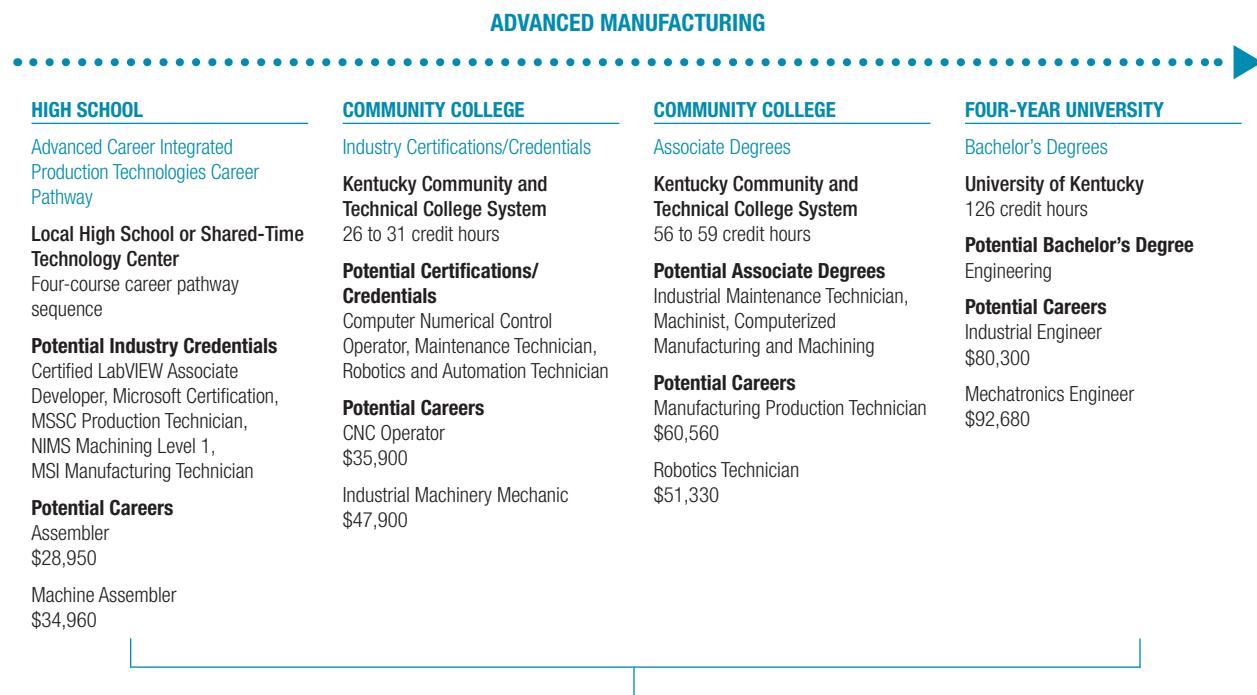
Career pathways create clear, easy-to-follow road maps to advanced industry and postsecondary credentials and good jobs.

Commission members agree that all states must do more with less money. Some states use a sector strategies approach to identify and invest in career pathways in high-growth industries. **Sector strategies** bring together government, education, economic and workforce development, labor, and community organizations to align education and workforce systems and reduce inefficiencies. They also draw in many small- and medium-sized businesses that may lack the resources to engage directly with schools, technology centers and colleges.⁵¹ After identifying its workforce needs, **Ohio** adopted a five-tier weighted funding formula that prioritizes pathways in high-demand fields. Tier I, for example, includes agricultural and environmental systems, construction technologies, engineering and science technologies, finance, health science, information technology and manufacturing technology.⁵²

SREB's Advanced Career pathway programs, designed in partnership with state, industry and postsecondary partners, align with postsecondary and industry standards and regional workforce needs. Figure 2 shows the educational and career trajectory of a **Kentucky** high school student who chose an Advanced Career Integrated Production Technologies pathway. After graduating with an entry-level industry credential, this student secured a job paying nearly \$35,000 a year as a machine assembler at the same company where the student job-shadowed and had a paid

FIGURE 2:

Sample SREB Advanced Career Pathway in Integrated Production Technologies — Kentucky⁵³



Dual Enrollment, Work-Based Learning and Career Guidance and Advising
are essential to career pathways at every step.

internship during high school. While working, the student applied the dual enrollment credits earned at a local Kentucky Community & Technical College System campus toward a robotics and automation technician certificate. With this certificate, the student could seek a promotion to an industrial machinery mechanic position paying more than \$47,000 a year. This student could also step back into the educational pipeline and earn an associate degree in computerized manufacturing and machining, which would lead to production or robotics technician positions. Or the student could pursue a 126-hour baccalaureate at the University of Kentucky, leading to even higher-paying jobs in industrial or mechatronics engineering.

Tennessee is retooling its career pathways to offer greater academic and technical rigor and align seamlessly with postsecondary programs that lead to high-demand jobs. The state retired outdated courses and is developing new courses and revising existing courses to blend academic college- and career-readiness standards with technical standards. In a plant and soil science course, for example, one module's older standards required students to define terms related to soil chemistry and plant nutrition, perform soil pH analyses and assess plants for diseases. The revised standards require students to use knowledge of plant growth and diseases to recommend treatments and prescribe preventive control measures for major crops. The module's technical standards link with new reading and writing standards and biology standards. The state plans to pilot new end-of-course assessments for revised courses in 2015-16.



Harry Brooks, Tennessee State Representative

Louisiana's Jump Start initiative, launched in the fall of 2014, is a comprehensive approach to creating career pathways to industry credentials and postsecondary certificates and degrees approved by the state's Workforce Investment Council. Regional teams of schools, community colleges, industry representatives and workforce development agencies create pathways that align with local jobs. Public-private partnerships help fund them. Pathways begin with a college-ready academic core, include elective career-planning courses in the ninth and 10th grades, and lead to more intensive career studies in grades 11 and 12. Extra time in the school day helps students earn advanced credentials. Schools and districts earn accountability rewards for students' achievements.⁵⁴

More Actions States Can Take to Create Pathways to Further Education and Jobs

Prioritize the investment of state and federal funds to develop rigorous, relevant career pathways that lead to employment in state and regional industry sectors with a shortage of skilled workers.

- Establish a state career pathway council composed of secondary and postsecondary education agencies, economic and workforce development agencies, labor departments and employers. Charge this council with identifying critical state and regional industry sectors and establishing procedures for regional councils to develop or adopt new career pathways and redesign or retire pathways that no longer prepare students to earn postsecondary credentials or secure good jobs.
- Work with external providers, districts, and community and technical colleges to audit career pathways for quality and alignment with workforce demand.

ACTION 2 — Expect all students to graduate academically ready for both college and careers.

SREB set a goal that 80 percent or more of all high school students should graduate ready for college and careers.⁵⁵ Although states differ in their college- and career-readiness standards, most agree that college-ready students are prepared to succeed, without remediation, in entry-level, credit-bearing postsecondary courses in fields that lead to industry-relevant certificates, credentials and degrees.⁵⁶

Most states are a long way from meeting this goal, and most acknowledge that, at least for the near future, some career pathway students may not meet academic college-readiness standards. Commission members urge states to establish academic career-readiness standards that prepare students with the **foundational literacy and math skills** needed to succeed in further education and training programs and the workplace.

In 2009, SREB's Committee to Improve High School Graduation Rates and Achievement noted that it may take time for all students to meet academic **college-readiness standards** — that is, the foundational reading, writing and math knowledge and skills needed to qualify for and succeed in entry-level, credit-bearing, college-degree courses without the need for remedial courses.⁵⁷

In the meantime, states can establish academic **career-readiness standards** — foundational literacy and math standards for advanced training programs and the workplace. By setting career-readiness standards, states are not creating separate tracks or lowering their standards but helping all students prepare for advanced education and training programs that include four-year colleges and universities. In adopting these standards, states must use their accountability systems to incentivize districts and schools to increase the number of students who graduate ready for both college and careers.

To increase students' academic readiness, states must reconsider the academic courses their high schools offer — especially math — and develop new courses in line with students' career and college goals. Research shows that, outside of specialized STEM fields, many postsecondary programs and occupations only require Algebra I, geometry, statistics and the kinds of math required in many careers.⁵⁸

Math instruction should focus on the skills required in the career fields and education students plan to pursue. For example, students interested in careers in STEM or the health sciences may need Algebra II and beyond. Students interested in other careers may benefit from math pathways that include Algebra I, geometry, statistics and other courses that emphasize applying math to real-world problems.

Research also shows that all career pathways demand a greater focus on literacy if students are to succeed in their postsecondary studies and the workplace. One study found that community college reading requirements are set at the 11th- or 12th-grade level — a level that many high school graduates have not achieved.⁵⁹ Such findings show the need to integrate literacy across the curriculum, especially in career pathways.

Commission members urge states to work with community and technical colleges to establish **college-readiness standards** for literacy and math and select a common assessment (such as the ACT) that students must take by the end of their junior year of high school to measure their readiness for advanced education and training.

All students must graduate with the foundational literacy and math skills needed in advanced training programs and the workplace.

States can use the results of academic readiness assessments to place seniors who need extra help into transitional readiness courses like SREB's Math Ready and Literacy Ready courses. **Math Ready** stresses understanding math concepts and learning the "why" behind math procedures rather than just memorizing them.⁶⁰ It promotes the higher-order reasoning skills students need to apply math skills, functions and concepts across settings. **Literacy Ready** stresses strategies for reading and understanding complex texts in all subjects. Students develop and defend ideas and write about them in college-level formats.

"There needs to be a match between the content of the math courses students are required to take and the actual math requirements for on-the-job-work. When you look at licensing exams, precision is the essential theme in almost all of them — a much deeper understanding of place values, scientific notation, fine measurement — and that is in almost none of [our high school] math courses."

— Uri Treisman, Director, Charles A. Dana Center, Professor of Mathematics, the University of Texas at Austin

Tennessee's SAILS (Seamless Alignment and Integrated Learning Support) initiative is a collaborative approach that prepares students for postsecondary studies. Tennessee juniors who score less than a 19 on the math portion of the ACT are required as seniors to take a community college developmental math course — Bridge Math, which counts as a fourth math credit toward graduation. SAILS blends Bridge Math with community college learning support math competencies. Students who pass Bridge Math enroll in credit-bearing math once they enter college. SAILS is also offered in a self-paced, hybrid online environment in which students complete six modules. In the first year of statewide scale-up, 8,400 students in 118 high schools participated, with support from all 13 of the state's community colleges. Eighty-one percent completed the equivalent of a community college developmental math course; 71 percent completed all of the community college learning support competencies and were ready for college-level math.⁶¹

Commission members agree that academic and CTE teachers need intensive professional development on how to incorporate applied literacy and math in their instruction and assignments.

Several national initiatives provide frameworks for doing this. The **Literacy Design Collaborative** incorporates rigorous literacy standards into middle grades and high school content areas in ways that advance students' literacy achievement and content knowledge.⁶² The **Mathematics Design Collaborative** shows teachers how to use formative assessment lessons to help students develop procedural fluency and deepen math reasoning and understanding.⁶³ The **Math-in-CTE, Science-in-CTE** and **Authentic Literacy** models developed by the National Research Center for Career and Technical Education at SREB use workplace learning to teach advanced math and science concepts and improve students' reading comprehension and vocabulary.⁶⁴

More Actions States Can Take to Increase Academic College and Career Readiness

Establish literacy- and math-readiness standards for non-STEM college majors and set benchmark cut scores on the assessments chosen to measure college readiness.

Collaborate with secondary, postsecondary and industry partners to establish the foundational literacy and math readiness standards needed for advanced education and training and non-degree programs and the workplace. Establish cut scores for academic career readiness on multiple validated assessments (such as nationally normed assessments) that predict success in advanced training programs. See Action 8 for more on how states can assign higher weights in their accountability systems for students who meet both college- and career-readiness standards.

- Ensure that standards for each career pathway reflect the requirements of the field — for example, students preparing for STEM-related certificate and degree programs will need an advanced algebra pathway.
- Develop state guidelines to inform the ongoing development and revision of academic and technical curricula and instructional approaches to meet these standards.

Use state-approved junior-year academic readiness assessments as a measure of students' academic preparedness for college and advanced training programs. Work with community and technical colleges to adopt or develop senior-year transitional readiness courses in literacy and math that count as fourth English or math credits. Allow students who pass these courses to be exempted from developmental education at the college.

ACTION 3 — Select assessments of technical and workplace readiness standards that offer long-term value to individual students, employers and the economy; carry college credits; and are directly linked to more advanced certifications and further study.

Today's jobs demand that individuals acquire both occupationally specific technical knowledge and a broad range of skills suitable for the larger industry. Employers also require **workplace readiness skills** — sometimes referred to as **employability skills**, soft skills or 21st-century skills — that include the ability to think critically, analyze information, anticipate and solve problems, communicate effectively, function on a team, follow directions, find

and use information, and adapt to new technology.⁶⁵ Personal qualities like integrity, motivation, persistence, reliability and willingness to learn are also important.

High-quality career pathways use instructional strategies like project-based learning, work-based learning, and enriched co-curricular activities like career and technical student organizations to teach students technical and workplace readiness skills. *All high school curricula, not just career pathway courses, should teach and assess these skills.*

Commission members urge states to work with secondary and postsecondary agencies, workforce agencies and employer associations to set **technical standards for career pathways** at the secondary and postsecondary levels and identify appropriate, industry-driven measures of technical and workplace readiness in those pathways.

Many states use **industry certification examinations** developed by third-party industry bodies to assess preparation for an industry or job.⁶⁶ Also known as industry-recognized credentials or industry-based certifications, these differ from examinations developed by software or equipment companies that measure whether students have acquired a narrow range of skills tied to specific software programs or technologies. Earned based on assessments of competency,⁶⁷ industry credentials are portable, flexible and responsive to changing standards.⁶⁸ Industry credentials also differ from certificates that signal general employability skills, like ACT's National Career Readiness Certificate.⁶⁹

"Settling for a low-level exam serves no one's interests."

— Stephen F. Hamilton, Director,
Cornell Youth and Work Program,
Cornell University

States face challenges in identifying appropriate industry credentials. First, many career pathways culminate in advanced credentials that exceed the time, resources and scope of the typical high school curriculum, unless more time is found for the instruction and work experience needed to earn them. In lieu of advanced certifications, many states are adopting lower-level certifications without evidence that their content prepares students for advanced education and training or aligns with industry standards, employer preferences and jobs. Such certifications may not meet SREB's criteria for the review of industry examinations.⁷⁰

Second, policymakers and educators lack reliable data on the content, rigor, reliability and relevance of many third-party industry certification examinations.⁷¹ Most states receive little student outcome data from industry examinations, and most cannot link student outcomes to labor market participation. States need such data to align pathways with workforce needs, improve curricula and assess readiness.

Commission members recommend that states work closely with each other and exam developers to increase access to certification data. The **Workforce Data Quality Campaign** (WDQC) is leading efforts to develop data-sharing agreements with industry bodies.⁷² Originally convened by the North Carolina Community College System and the California Community College Division of Workforce and Economic Development, the WDQC is a consortium of 21 states — including **Alabama, Delaware, Florida, Georgia, North Carolina, South Carolina, Texas and Virginia** — whose goal is to access exam data, establish joint data-sharing agreements and better align their pathways with available certifications and industry needs. The WDQC is urging the federal government to create a national credential directory.⁷³

States must avoid a "race to the bottom" when setting criteria for selecting industry certification examinations.

Finally, Commission members urge states to consider developing **stackable credential systems**, like those in **Kentucky, Ohio and Virginia**, to ensure that students earn certifications valued in the labor market. Such systems allow students to earn entry-level certifications in high school and progress to more advanced certifications, licenses and degrees at the postsecondary level.⁷⁴ Stackable credential systems may include:

- **modular sequences of industry examinations.** Full Automotive Service Excellence certification, for example, requires candidates to complete a series of exams plus two years of work experience. Students may take some exams in high school and complete the series at the postsecondary level.

- validated **end-of-course** or **end-of-program assessments** that demonstrate students' academic, technical and workplace skills. Some are treated as certifications or carry college credit.
- validated **employer examinations**.
- **career pathway dual enrollment courses** that carry college credit.
- credit for **prior learning and work experiences**.
- **modularized associate degree** programs made up of shorter, stackable programs.

More Actions States Can Take to Assess Technical and Workplace Readiness

Define technical career readiness in state policy, capturing the knowledge and skills students must master to enter postsecondary education and training programs and secure high-skill, high-wage jobs in high-demand fields.

Designate a state agency to work with secondary and postsecondary education agencies and employers to identify, evaluate and approve industry certification examinations, technical skills assessments, dual credit courses and end-of-course assessments that are part of a system of stackable credentials.

- At the high school level, ensure that industry exams and other assessments (a) reflect appropriate depth and breadth of academic and technical content, (b) offer an advantage in the workplace and are linked to in-demand jobs, (c) carry variable amounts of transferrable college credit based on their rigor and the time required to obtain them, and (d) lead to more advanced credentials.
- In cases in which high school-level industry examinations do not exist, adopt advanced examinations and set acceptable passing scores for partial certification, with the expectation that graduates will earn the full certification at the postsecondary level. (See Action 8 for accountability options for measuring technical readiness.)
- Ensure that students and parents do not have to pay for examinations used by the state as technical skills assessments, accountability measures or graduation requirements.

Draw on the expertise of secondary, postsecondary and industry partners to identify or develop juried assessments and rubrics that measure students' attainment of workplace skills through their performance on project-based or work-based learning assignments and senior capstone projects.

- Invite schools to voluntarily adopt, test and validate these assessments and rubrics, and incentivize employer participation in assessing and showcasing student work.

Join with other states to advocate for a national database of industry certification examinations. Include in this database how many industry certifications students attempt and earn as well as the exams' depth and breadth of academic and technical content and connection to workforce needs. Work with other states to promote data-sharing agreements and protect student data.

ACTION 4 — Provide all high school career pathway teachers, especially new teachers from industry, with the professional development and fast-track induction programs they need to meet high academic, technical and pedagogical standards and enhance students' academic and technical readiness for college and careers.

Today's CTE teachers do more than teach technical skills: They prepare students for a modern workplace in which workers must understand complex technical materials, conduct research, apply math, use technology and function well as team players who can anticipate and solve problems proactively.

Commission members agree that states must provide all career pathway teachers with **professional development that supports students' academic and technical readiness**. In addition, new teachers from industry backgrounds need fast-track induction programs that prepare them to teach in rigorous career pathway programs.

Most states use alternative certification to recruit teachers with valuable industry experience.⁷⁵ SREB finds that about 75 percent of all new CTE teachers enter the profession through this route rather than through traditional teacher preparation programs.⁷⁶

Requirements for alternative certification vary greatly among and within districts and states, with some routes taking as many as five years to complete.⁷⁷ Few states require new teachers to participate in an intensive induction program or receive support during their first year of teaching. Most new CTE teachers enter the classroom with little training and no experience designing real-world assignments, managing diverse learners, preparing exams, or embedding literacy and math in their instruction. Without adequate support, new CTE teachers are more likely to leave the profession within the first few years of teaching.⁷⁸

In SREB's surveys of teachers at HSTW and TCTW sites, a high percentage of new CTE teachers report a need for professional development on creating real-world, project-based assignments, engaging students in literacy and math, and helping students use software and technology. HSTW and TCTW teacher survey results also show that at least half of veteran CTE teachers need strong preparation and professional development related to designing real-world assignments.

Both new and veteran academic and CTE teachers need ongoing professional development to raise the quality of their instruction.

Many states offer high-quality teacher induction programs that prepare new teachers with the pedagogical and classroom management skills they need to plan, deliver and assess instruction. Systems like SREB's **Teaching to Lead** are long-term, intensive and include ongoing development, coaching and support. Research shows that one-time workshops are not enough to change practices and improve student outcomes.⁷⁹ States like **Kentucky, Mississippi, Missouri, Oklahoma, Vermont** and **West Virginia** and large school districts in cities like **Louisville, Kentucky**, and **Nashville, Tennessee**, have adopted Teaching to Lead. Administrators in one state report that new teachers who participated were better prepared, more confident and had a plan to improve.

Similarly, many states adopting STEM-focused career pathways like **Project Lead the Way** or **SREB's Advanced Career** curricula recruit teachers from both academic and CTE programs and prepare them with intensive initial training and ongoing professional development. During a two-week summer session, Advanced Career teachers learn each course's technical content, technology, software and embedded mathematics, complete project-based assignments, explore strategies



"Many of our teachers need training to teach the new kinds of career pathway programs that blend college-ready academics and technical content and emphasize real-world, work-related projects. Many teachers are used to traditional CTE courses that focus more on procedures than on solving problems."

— Steve Beshear, Governor,
Commonwealth of Kentucky

Fast-Track Teacher Induction That Works

SREB and the National Research Center for Career and Technical Education created, field-tested and validated a fast-track induction program for alternatively certified teachers.

Teaching to Lead builds the capacity of CTE teachers to design intellectually demanding, standards-focused instruction and use strategies like project-based learning, work-based learning and cooperative learning. Teachers participate in 200 hours of professional development within the first 18 months of employment, receive expert coaching during their first year of teaching and participate in a community of practice.

Results from the original research study of the model showed increased retention and self-efficacy in instruction, classroom management and student engagement. After Mississippi adopted the model, teacher attrition dropped from nearly 30 percent of all new teachers in 2008 to no teachers in 2012.⁸⁰

to engage students in scientific inquiry and the engineering design process, learn how to embed literacy skills in instruction, and acquire strategies for managing their classrooms and assessing student learning.

In addition to participating in robust induction programs and professional development, CTE teachers also need to continuously re-engage with their career fields. Summer externships at work sites offer teachers a chance to test and reformulate their assignments based on current industry standards. Such experiences can also help teachers learn about new career opportunities for their students.

More Actions States Can Take to Prepare Career Pathway Teachers

Adapt standards developed by the National Board for Professional Teaching Standards (NBPTS) that require CTE teachers to: meet the academic standards expected of all teachers; show mastery of technical content; hold a state license as well as a bachelor's if required by their state; demonstrate effective teaching practices; and engage in ongoing professional development.⁸¹ In some career pathway fields, accept teachers with associate degrees or their equivalent.

- Require secondary and postsecondary CTE teachers to hold the industry credentials they are preparing students to acquire. Provide teachers who do not have these credentials with the training they need to earn them.

Allocate funds for new teachers from industry to participate in fast-track induction programs that span the first 15 months of teaching and include two weeks to one month of paid employment in the summer before they enter the classroom. Ensure that fast-track induction programs are collaboratively designed and delivered by specially selected master teachers and industry partners.

Work with postsecondary and industry partners and external providers to deliver research-based professional development that teaches academic and CTE teachers how to design real-world, project-based instruction, assignments and assessments that integrate literacy, math and science with technical content. Help teachers integrate project-based learning, work-based learning and online teaching in their instruction. (See Action 1A for more on professional development related to rigorous assignments.)

Partner with employers to help teachers periodically refresh their skills through required industry externships and work experiences.

ACTION 5 — Adopt a framework of strategies to restructure low-performing high schools around rigorous, relevant career pathways that accelerate learning and prepare students for postsecondary credentials and degrees.

Although SREB states are steadily improving their graduation rates, most still have more than their fair share of low-performing high schools. As of 2011-12, 878 high schools in the SREB region had graduation rates lower than 70 percent.⁸² Previous reforms targeting these schools often failed because their focus was limited to remediating students in English and math in isolation from their other classes. Most reforms do not emphasize the mastery of grade-level standards across school curricula or include career pathways that engage students in work-based learning and align with postsecondary education and workplace opportunities. Improving student performance — and giving students hope for the future — must be the responsibility of the entire school, not just English and math teachers.

High-quality career pathways help students get engaged, achieve more, stay in school and gain hope for the future.

Whole-school reforms that organize high school curricula around high-quality career studies work. Commission members agree that high-quality CTE keeps students engaged, helps them achieve at higher levels, prevents dropout, and promotes successful transitions to college and the workplace, with particular benefits for low-income and minority students, first-generation college-goers and young men. Earning three or more CTE credits is a strong

predictor of staying in high school, especially for young men; concentrating in CTE is second only to ninth-grade GPA in predicting high school survival.⁸³ Although high-quality CTE benefits *all* students, including high-performing students, students in low-performing schools often have the least access to high-quality career pathways that lead to further education and good jobs.

Commission members challenge states to transform low-performing high schools by adopting an accelerated, comprehensive framework of strategies derived from the signature features of SREB's **High Schools That Work** improvement model and the **Linked Learning** whole-school reform model.⁸⁴ Schools using strategies like these significantly increase student achievement and raise graduation rates. After implementing HSTW, **Queens Vocational & Technical High School** in Long Island City, New York, raised its New York City Progress Report rating from a C in 2007 to an A in 2010; its graduation rate rose from 58 percent in 2007 to 73 percent in 2010.

Delaware sets high expectations for all students by embracing higher standards, focusing on literacy and math as the foundation of all other learning and increasing student access to career pathways that emphasize academic knowledge and skills. The state also places its best teachers and leaders in its lowest-performing schools to create a critical mass of intense instruction and focused leadership. **Howard High School of Technology in Wilmington, Delaware**, for example, designed a transformation plan that puts an intense focus on literacy and math combined with rigorous career pathways offered in small learning communities. Within one year, this high school rose from the bottom 5 percent on reading and math performance to "the critical middle," according to Teri Gray, president of the Delaware State Board of Education.

States may wish to accelerate the pace of reform by converting some low-performing high schools into wall-to-wall career academies or creating magnet academies within schools. Such academies could be governed by school councils including parents, industry representatives and faculty from local postsecondary institutions with related programs.

Georgia's Gwinnett County Public Schools, one of the nation's largest districts and a two-time winner of the Broad Prize for Urban Education, reorganized five comprehensive high schools into wall-to-wall career-themed academies of choice. Each academy offers career pathway course sequences that align with a college-ready academic core. Teams made up of an assistant principal, a counselor, a lead academic teacher and a lead CTE teacher use SREB's HSTW model to design their academies, create new pathways, and offer career and college counseling. In 2013-14, ninth- and 10th-grade teachers began participating in professional development on the Literacy Design Collaborative and the Mathematics Design Collaborative instructional frameworks. This professional development will continue through the 2014-15 school year.

More Actions States Can Take to Restructure Low-Performing High Schools

Establish in policy a framework of strategies for restructuring schools that includes all of the essential elements described in Action 1, including:

- at least four sequential CTE courses.
- a college-ready academic core taught with a greater emphasis on project-based assignments that integrate academic, technical and workplace skills.



"Howard High School's success was about more than just CTE. You had leadership who said every student, community member and parent will understand the importance of literacy and the basic foundations of math, and this showed up across every area."

— Teri Gray, President, Delaware State Board of Education

- scaffolding and supports to raise students to grade-level literacy and math standards, including tutoring, supplemental instruction and transition courses.
- ongoing work-based learning experiences.
- continuous counseling and advisement that help all students identify a career goal, connect with adult mentors and plan for careers and further study.
- opportunities to earn college credits.
- a schedule that allows students to take classes as a cohort and gives academic and CTE teachers time to plan integrated project-based assignments.
- opportunities to participate in co-curricular career and technical student organizations, which help students develop valuable technical, leadership and employability skills.
- extended-day, after-school and summer bridge activities that enhance readiness.

Use federal, state and local funds to help low-performing high schools reorganize around theme-based career academies featuring rigorous, relevant career pathways.

- Require low-performing schools to extend their school years or days so students may receive intensive instruction, engage in work-based learning and earn advanced credentials or degrees.
- Offer ongoing, intensive professional development and technical assistance to teachers, counselors and administrators on how to implement rigorous career pathways and improve literacy and math achievement. Include feeder middle grades schools in all reform strategies and professional development activities.

Engage and support district and school leaders, industry and postsecondary partners, community members and parents in taking ownership of career pathways as an essential element of reforming low-performing schools.

- Foster sustainability by holding school boards and communities accountable for reform.
- Monitor the fidelity of reform implementation through external audits and faculty, student and parent surveys.

ACTION 6 — Offer early advanced credential programs in shared-time technology centers, aligning their curricula, instruction and technology with home high schools and community and technical colleges.

SREB states have more than 500 shared-time technology centers that offer specialized training programs leading to advanced credentials that are often too expensive for comprehensive high schools to offer. Although curricula and instruction in some centers have not kept pace with jobs in emerging industries, most centers are a vibrant component of states' education and workforce preparation systems. In combination with community and technical colleges, technology centers play a critical role in meeting the demand for advanced credentials and degrees.

As academic requirements for graduation have risen in all states, most students — especially students attending shared-time technology centers — no longer have time to pursue career pathways leading to advanced certifications and further study. In areas where shared-time centers serve many schools or districts, too many students spend too much time in transit to centers, reducing instruction time. Further, in many centers, students arrive and depart at all different times of the day. Commission members agree that states must seek ways to synchronize schedules so high schools and shared-time centers can provide the extended time needed to offer high-quality instruction and work-based learning.

Commission members also agree that technology centers must prepare students with the foundational skills necessary to earn advanced industry credentials and postsecondary certificates and degrees. At present, many struggle to do so. Significantly fewer students attending SREB's TCTW shared-time centers are meeting math and literacy readiness standards compared to students completing CTE programs at comprehensive high schools.

States should incentivize shared-time centers and home high schools to align their courses, integrate academic and technical instruction, plan integrated assignments and engage in shared professional development. New school structures or schedules, like 13th-year programs and extended school years or days, will help more technology center students earn advanced credentials.

States might also consider converting some shared-time centers into full-time technology centers or technical high schools, like those in **Delaware's Polytech High School**, **Sussex Tech High School** and **New Castle County Vocational Technical School District**. Full-time technical high schools like these achieve high graduation and readiness rates because their curricula are organized around career pathways featuring integrated instruction delivered by interdisciplinary teacher teams. Full-time technical high schools are the ideal setting for the early advanced credential programs described in Action 1.

More Actions States Can Take to Offer Early Advanced Credential Programs

Create the time needed for technology center students to earn advanced industry credentials by:

- offering full-time study during students' junior and senior years.
- extending the school year or the school day.
- creating 13th-year early advanced credential programs.
- converting some centers into full-time technical high schools or full-time regional magnets.
- partnering with community and technical colleges to offer junior- and senior-year career pathway instruction.

Enrich the quality of instruction at technology centers by staffing them with literacy and math teachers who work with CTE teachers to embed academics in CTE assignments and provide students with the supplemental English and math courses needed to meet academic readiness benchmarks. Allow students to earn graduation credits for these courses.

- Work with home high schools to align literacy and math instruction and assignments with career pathway courses if instructional time cannot be extended at the technology center.

Technology Centers Serving High School Students and Adult Learners

Oklahoma's 29 technology centers serve high school and adult education students with specialized career training in nearly 100 career pathways. High school students attend tuition-free and earn transferrable college credits in many pathways. High school students can return for a 13th year to earn advanced industry credentials. In 2014, Oklahoma's technology centers enrolled a total of 29,627 full-time students — 11,565 adults and 18,062 high school students. More than 4 percent of those high school students were 2013 12th graders who returned for a 13th year. Statewide, in 2013, the industry certification pass rate for all adult and secondary students was above 93 percent.⁸⁵

In Ohio, many of the state's 49 full-time career centers offer co-located high school and adult education programs. High school juniors and seniors attend full time and pursue a range of career pathways featuring integrated academics, industry certifications and college credits. In 2013-14, 55,326 secondary students earned a minimum of 6,276 certifications at Ohio's career centers; 31,591 adult students earned 218,694 certifications.⁸⁶

ACTION 7 — Incentivize community and technical colleges and school districts to double the percentage of students who earn certificates, credentials and degrees by setting statewide readiness standards and aligning assessment and placement measures with those standards. Other strategies: Use the senior year of high school to reduce the number of students who need remediation, retool developmental education, adopt individualized support strategies for struggling students and improve affordability.

Most community and technical colleges serve high percentages of students who lack foundational literacy and math skills: Sixty percent or more of all community college students require some remediation.⁸⁷ Many of these students are moved into non-credit bearing developmental education courses that have no connection to their occupational goals and careers; many leave college without a credential.⁸⁸

Community and technical colleges provide excellent value for money — and the quickest, most affordable route to the credentials and degrees industry needs.

In Action 2, Commission members urge community and technical colleges to partner with school districts and develop junior-year readiness assessments and senior-year transitional courses that help more high school students prepare for postsecondary study.

With Action 7, Commission members challenge community and technical colleges to adopt strategies that help more students complete their programs, earn credentials and degrees and enter the workforce. Some colleges already use strategies like new assessment and placement measures, restructured developmental education programs and individualized student support systems.

Many community and technical colleges use **multiple measures of readiness** to help more students avoid developmental education. Such measures include the GPA, the best predictor of readiness, in addition to standardized test scores and placement exams.

Some colleges tailor math to students' career pathways. The **North Carolina Community College System** drew on research on the math skills needed in various occupations⁸⁹ to restructure its math programs around four pathways: *Vocational* (mathematical measurement and literacy) for selected diplomas or Associate in Applied Science (AAS) programs; *Applied Technologies* (algebra, trigonometry) for AAS engineering technologies programs; *Calculus* (pre-calculus, algebra, calculus or statistics) for Associate in Science degree STEM programs; and *Quantitative Literacy* (quantitative literacy/statistics) for associate degree programs in the liberal arts and some AAS degrees.



Wesley Beddard, North Carolina
Community College System

Some community and technical colleges use **applied**⁹⁰ or **contextualized**⁹¹ **approaches** to instruction. The **Integrated Basic Education and Skills Training** (I-BEST) model, developed by the **Washington State Board of Community and Technical Colleges**, uses a team-teaching approach to contextualize literacy and math and improve achievement for low-skilled adults.⁹²

Other colleges employ **co-requisite instruction** or **co-enrollment** approaches through which students take credit-bearing general education classes and receive extra help.⁹³

Specialized courses that tailor math to students' pathways also hold promise. The **Carnegie Foundation for the Advancement of Teaching** created two community college math pathways in statistics and quantitative reasoning. In two years of field-tests, over half of students enrolled in these pathways earned math credit within a year.⁹⁴

Some community and technical colleges support credential attainment through **structurally guided pathways** that students can follow to graduation and into the workplace. Structured pathways reduce unfocused course-taking, lower the cost of postsecondary education and help students complete their programs quickly. Essential features are coherent pathways that align with well-defined educational and career outcomes; structured guidance that helps students enroll in programs, overcome educational deficits and identify a field of study; and ongoing support that measures progress and keeps students on track.⁹⁵

Finally, Commission members urge states to make postsecondary career pathways more affordable through **learn-and-earn programs** developed by employers and community colleges. Many students face significant financial barriers due to the length of their programs. Many work part-time because they lack eligibility for federal Pell aid or state need-based aid.

The Accelerating Opportunity Model

The **Kentucky Community & Technical College System** is implementing **Accelerating Opportunity**, a variation of the I-BEST model. Seventy-one percent of the system's 95,000 students need remedial literacy or math instruction. Since 2012, 1,061 adult students have enrolled in 30 Accelerating Opportunity programs at 11 community and technical colleges; 68 percent earned a credential, compared to just 9 percent of non-participating first-time community college students. Participating students were also more likely to enroll in a subsequent term and earn another credential after completing the program. After one semester, 30 out of 47 participating students at one college tested out of 61 remedial classes, saving \$26,352.⁹⁶

More Actions States Can Take to Double Postsecondary Credential Attainment

Use a combination of incentives and performance-based funding models to encourage community and technical colleges to work with school districts to increase the percentage of students who complete their programs and earn industry credentials and postsecondary certificates and degrees. (See Action 1B and Action 3 for steps states can take to create dual enrollment programs and stackable credential systems that help high school students earn transferrable college credits that accelerate postsecondary credential and degree attainment.)

Increase the number of ways students can qualify for credit-bearing course work and avoid developmental education. Establish multiple measures of postsecondary readiness, such as the GPA, benchmark scores on nationally normed assessments and college placement exams.

- Allow students who score below college-ready benchmarks to co-enroll in college credit-bearing academic and CTE courses and developmental instruction.
- Redesign developmental math pathways to reflect the math skills needed in STEM and non-STEM fields.
- Create multiple measures for student placement in those pathways.

Offer community and technical college students supplemental tutoring and skills labs. Use individualized supports such as early warning systems, success courses, learning communities and summer bridge programs.

Increase financial aid for students enrolled in advanced training programs that lead to credentials in key industries. Incentivize employers and community and technical colleges to invest in learn-and-earn programs that allow students to acquire credentials while earning a living wage, such as South Carolina's apprenticeship system.

ACTION 8 — Design accountability systems that recognize and reward districts, high schools, technology centers, and community and technical colleges that double the number of young adults who acquire postsecondary credentials and secure high-skill, high-wage jobs by age 25.

Many states do not have accountability systems that measure whether career pathways are preparing more students for success in postsecondary education and the workplace. Many have not defined, or have only loosely defined, what college and career readiness means. Only six of 16 SREB states — **Florida, Georgia, Kentucky, Tennessee, Texas**

and **Virginia** — officially define *college readiness*, *career readiness*, or *college and career readiness*. Only seven states — **Alabama, Florida, Georgia, Kentucky, Louisiana, Maryland** and **North Carolina** — include measures specifically related to career pathways in the performance goals they adopted after receiving No Child Left Behind accountability waivers, like ACT or WorkKeys scores, dual enrollment participation, industry certification examinations and numbers of CTE concentrators.⁹⁷

In Actions 2 and 3, Commission members urge state secondary and postsecondary education agencies to work with industry partners to define college and career readiness and establish standards, benchmarks and assessments of academic, technical and workplace readiness. With Action 8, Commission members challenge states to build accountability systems that advance the readiness goals they wish to achieve.

Accountability systems must incentivize and reward high schools and community and technical colleges that develop rigorous career pathways and assess and recognize the outcomes of those pathways. Robust state accountability systems should include indicators and assessments that capture diverse outcomes that signal student readiness for advanced education and training programs and entry-level jobs in high-demand fields.

In making this recommendation, Commission members acknowledge that although high schools will have to work harder to prepare students for postsecondary education, postsecondary institutions will bear the responsibility of ensuring that students complete their programs and earn credentials.

At present, most state secondary and postsecondary institutions are not governed by the same kinds of accountability or funding systems. Some states allocate postsecondary funding based on student enrollment; more recently, a few states have adopted performance-based funding models to award some percentage of an institution's overall funding based on selected outcomes. States currently using or considering **performance-based funding models** should adopt **credential completion** as a measure in their funding formulas. Further, states should consider establishing special competitive funds to promote certificate and credential completion in high-demand fields. Working in collaboration with school districts and high schools, community and technical colleges could compete for funds to design career pathways spanning secondary and postsecondary education that result in more students earning advanced industry certifications and postsecondary certificates, credentials and degrees.

Under **Kentucky**'s accountability system, high schools receive one point for each student who meets college- or career-readiness benchmarks plus a bonus half-point for each student who meets both college- and career-readiness benchmarks. When the state first established this model in 2009, just 34 percent of graduates were both college- and career-ready; by 2014, that number rose to 62 percent.⁹⁸

More Actions States Can Take to Design Accountability Systems

Adopt policies to ensure that, depending on their goals, all students can pursue multiple pathways to a single high school diploma. Award special endorsements to students who meet academic career-readiness standards, complete a career pathway or graduate with a diploma plus advanced industry credentials or significant credits toward an associate degree or other postsecondary credential.

- Reward districts, schools and teachers for helping more students earn special endorsements.
- Award merit scholarships to students who earn special endorsements.



"When you're making your accountability decisions, remember what behaviors you want to drive."

— Terry Holliday, Commissioner of Education,
Kentucky Department of Education

Allocate extra weight in state accountability systems for each high school student who meets both academic college-readiness standards and technical career-readiness standards. Ensure that the state accountability system values academic college readiness and academic and technical career readiness equally.

Allocate extra weight in state accountability systems for each high school student who completes an advanced industry credential in a critical industry sector.

- Incentivize high schools, technology centers, community and technical colleges, and instructors to motivate more students to acquire advanced credentials and degrees in critical industries.

Increase each year the percentage of high school students who demonstrate academic, technical and workplace readiness by:

- a. completing capstone courses, senior portfolios, career and technical student organization competitions, or work-based learning experiences;
- b. attaining advanced industry credentials;
- c. earning dual credits for career pathway courses; and/or
- d. passing end-of-course assessments for career pathway courses that generate extra weight toward the GPA or carry college credit.

Florida's Diploma Requirements

As of 2013, Florida students seeking a state diploma must complete a minimum of 24 credits, with an academic core of four English, four math, three science and three social studies courses.

Each standard diploma may carry up to two additional designations: (1) **scholar**, a college-preparatory course of studies that includes two credits of the same foreign language and at least one Advanced Placement, International Baccalaureate, Advanced International Certificate of Education or dual enrollment credit; and (2) **merit**, which requires students to acquire an industry-recognized credential validated by the Florida Department of Education in line with the state's Economic Security Report.⁹⁹

Establish a multi-measure, college- and career-ready performance index to assess, track and report progress made by school districts, high schools, community and technical colleges, and employers delivering career pathways. Expect secondary and postsecondary partners to:

- Raise high school graduation rates to 90 percent or higher in all high schools within a decade or less. Help schools with graduation rates of 70 percent or less raise their graduation rates to 80 percent or higher within five years.
- Increase the percentage of students who leave high school academically prepared for college and careers to 80 percent or higher.
- Increase each year the percentage of students who meet academic career-readiness benchmarks for the foundational literacy and math skills appropriate to their career pathways.
- Increase each year the percentage of high school students who complete a career pathway consisting of a college-ready academic core and at least four sequential CTE courses leading to further education and training and workforce opportunities.
- Increase each year the percentage of high school graduates who immediately enter some form of postsecondary education, including employer-sponsored work-based training programs.
- Double over the next decade the percentage of young people who complete advanced industry credentials, postsecondary certificates and degrees by age 25.
- Expand each year the number of secondary and postsecondary students who participate in employer-sponsored work-based experiences and learn-and-earn programs.

Pathways to Tomorrow's Careers

The challenge from SREB's Commission on Career and Technical Education: States must double the number of young adults with the education it takes to begin a good career and continue learning. The career pathways described in this report — pathways to tomorrow's careers that span high school, community and technical colleges, and the workplace — will put states on the right course to meet that challenge. And students, schools, communities, employers, community and technical colleges, states and the nation will reap the benefits.

For students — Career pathways help students see college as a gateway to earning a meaningful credential linked to real workforce opportunities.

For schools — Career pathways help students stay engaged and on track to graduate with valuable credentials beyond the high school diploma.

For communities — Career pathways empower young people to recognize, develop and use their skills and talents to better themselves, their families and the cities and towns in which they live.

For employers — Career pathways make business a full partner in education and ensure that employees have the foundational knowledge and skills to adapt to constantly changing workplace requirements.

For community and technical colleges — Career pathways prepare more students for postsecondary success, reduce the need for remediation and free up resources to develop new programs.

For states — Career pathways attract new businesses, lower unemployment and underemployment, and ensure future economic security.

For the nation — Career pathways can help protect individuals and society from economic uncertainty and help more young people buy homes, start families and participate in the American consumer economy.

SREB Commission on Career and Technical Education

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* Titles as of the May 2014 meeting of the Commission.

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Members of SREB's Commission on Career and Technical Education, May 20, 2014: Left to right, front row: Jean Massey, Gayle Flowers, Tim Shaughnessy, Alan Baker, Katharine Oliver, Gene Bottoms. Second row: David Sokola, Joe May, Joe Meyer, Elizabeth Creamer, Norman Conway, Teri Gray. Third row: Terry Burton, Harry Brooks, June Atkinson, Lloyd Jackson, Tom Zawacki. Fourth row: Donald Griffith, Steve Gratz, John Legg, Mike Wilson. Fifth row: Dale Winkler, Dave Spence, Greg Higdon, Alvin Wilbanks, Terry Holliday. Sixth row: Derrick Graham, Michael Berry.

Endnotes

- ¹ “Table 2: Public high school 4-year adjusted cohort graduation rate (ACGR), by race/ethnicity and selected demographics for the United States, the 50 states, the District of Columbia, and other jurisdictions: School year 2011–12.” U.S. Department of Education, National Center for Education Statistics (NCES), 2014. http://nces.ed.gov/pubs2014/2014391/tables/table_02.asp
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- ¹⁸ Personal communication, Anthony P. Carnevale, Director, Georgetown University Center on Education and the Workforce, February 18, 2015.

- ¹⁹ “Students at Community Colleges.” American Association of Community Colleges, 2014. See <http://www.aacc.nche.edu/AboutCC/Trends/Pages/studentsatcommunitycolleges.aspx>
- ²⁰ The federal legislation governing CTE — Carl D. Perkins Career and Technical Education Improvement Act of 2006, known as Perkins IV — requires states to offer *programs of study* that incorporate opportunities to earn college credit in high school and lead to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree. See <http://cte.ed.gov/nationalinitiatives/localstudyimplementation.cfm> for resources produced by the Perkins Collaborative Resource Network for Program and Data Quality, Office of Career, Technical and Adult Education, U.S. Department of Education.
- ²¹ See <http://careertech.org/career-clusters>. Some states have identified additional pathways and clusters.
- ²² Led by the U.S. Departments of Education, Health and Human Services and Labor, the Career Pathways Joint Initiative seeks to align federal and state funding streams and resources to help adult learners acquire skills and credentials. See http://cte.ed.gov/nationalinitiatives/career_pathways.cfm. See also *Shared Vision, Strong Systems: The Alliance for Quality Career Pathways Framework Version 1.0: Executive Summary*. Center for Law and Social Policy (CLASP), 2014.
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