Scaling What Works

*Policies to Support Individual High School
Career-Connected Learning Models*

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Bellwether

Introduction

High school-based career-connected learning models can give students an early start on pursuing their postsecondary and career goals. Some models — particularly career academies, career and technical education (CTE) programs of study, CTE dual or concurrent enrollment, early college high schools (ECHS), pathways in technology early college high schools (P-TECHs), and youth apprenticeships — have been studied for their effects on student outcomes and show promising results.

State legislators and education agency leaders seeking to bridge the gap between the education currently provided to students and the education they need to earn a family-sustaining wage should consider building on and scaling these models. To do so, they can take concrete steps to create the conditions for each of these evidence-based career-connected learning models to thrive.

Drawing on desk research and expert interviews, this brief defines these models and summarizes the evidence of their impact. It then identifies a set of key policies that are critical to the success and sustainability of these individual models. While not exhaustive, these policies offer a practical starting point for states seeking to build or strengthen one or more models.

High School-Based Career-Connected Learning Models

High school-based career-connected learning models include a variety of programs that blend secondary and postsecondary academic and technical learning with authentic work-based experiences, improving outcomes in academic achievement, college enrollment, persistence, employment, and earnings. The six learning models included in this brief are:

Career Academies — Specialized high school programs (often called "schools within a school") that integrate academic and technical education around a specific career theme, such as health sciences, engineering, or business. Career academies combine rigorous academic coursework with career-focused learning and work-based learning experiences.

CTE Dual or Concurrent Enrollment — An educational arrangement where high school students are enrolled simultaneously in secondary and postsecondary coursework. Like traditional academic programs, students participating in CTE dual or concurrent enrollment can earn college credits that count toward both high school graduation and a postsecondary degree or professional certificate. These programs are designed to accelerate educational opportunities, enhance the rigor of high school education, and provide students with a head start on career readiness.

CTE Programs of Study — High school programs that integrate academic and technical skills, offering practical knowledge and hands-on experience in specific career fields. Through CTE programs of study, students complete a sequence of related courses in a specific career pathway, culminating in industry-recognized credentials, certifications, and/or college credits.

ECHS — An educational model that blends high school and college in a cohesive, integrated program within a specialized school. It enables learners to simultaneously earn a high school diploma and substantial college credits toward an associate or bachelor's degree.

P-TECH — An educational model that integrates high school, college, and career training within a specialized school to equip students with the skills and credentials needed for the workforce. Students can complete high school and college coursework simultaneously, while earning a high school diploma and an associate degree within six years at no cost. P-TECH schools partner with industry leaders to provide mentorship, internships, and work-based learning opportunities, strongly emphasizing STEM fields.

Youth Apprenticeship — Education programs that combine academic instruction with work-based learning for high school students. These programs are designed to provide students with practical, hands-on experience in a specific trade or profession while they continue to meet their high school graduation requirements. Youth apprenticeships aim to bridge the gap between school and the workforce by providing young people with the skills, knowledge, and work experience necessary to succeed in today's economy.

The Evidence on Each Model's Impact on Student Outcomes

Though other high school-based career-connected learning models exist, this brief focuses on those with the greatest evidence behind them (Table). The research and evidence on each model tend to capture a variety of student outcomes: academic achievement, high school completion, college enrollment, postsecondary attainment, employment, and wages and earnings.

While more research is needed to understand the associations among model design, adoption, implementation, and student outcomes, the existing evidence suggests that the six models included in this brief are associated with positive student outcomes.

It is difficult to determine the exact number of model programs that exist in each state, or even how many states have each model, but existing research indicates that every state and the District of Columbia has at least one career-connected learning model in place. Yet widespread adoption remains limited, and scaling any one model continues to prove elusive. For these models to continue to grow and flourish, states must address key policy levers to unlock the ability for more K-12 districts to adopt them.

Model	Research Supporting Model	Associated With Positive Outcomes					
		Academic Achievement	High School Completion	College Enrollment	Postsecondary Attainment	Employment	Wages and Earnings
Career Academies	Students who attend career academies earn more per month, on average, than non-academy students, and are more likely to graduate on time and lead independent lives with children and a spouse or partner.[1] The positive effects associated with attending a career academy are especially notable in males and high-risk students.[2]		✓			✓	✓
CTE Dual or Concurrent Enrollment	A North Carolina-focused study found that CTE dual enrollment students, compared with non-CTE dual enrollment students, had significantly higher weighted high school GPAs, earned more transferable college credits, and were more likely to graduate high school and enroll in a two-year postsecondary institution.[3] The study also found a statistically significant increase in high school graduation rates for economically disadvantaged students. Dual enrollment CTE students in Florida were 18 percentage points more likely to enroll in college after high school; in California, they were 5 percentage points more likely.[4] These studies also found greater gains in college GPA and credit accumulation.	✓	✓	✓	✓		
CTE Programs of Study	A research synthesis of studies on the impact of participating in CTE found statistically significant positive impacts on academic achievement, high school completion, employability skills, and college readiness compared to non-CTE students.[5] CTE students were more likely to enroll in a two-year college and to be employed after high school.[6] CTE concentrators and completers have higher high school graduation rates compared to non-CTE students.[7] High school CTE concentrators go on to earn higher median salaries eight years after graduation compared to non-concentrators.[8]	✓	✓	✓		✓	✓

Model	Research Supporting Model	Associated With Positive Outcomes					
		Academic Achievement	High School Completion	College Enrollment	Postsecondary Attainment	Employment	Wages and Earnings
ECHS	ECHS students are significantly more likely than non-ECHS students to graduate high school, enroll in college, and earn a college degree.[9] ECHS students are 22% more likely to earn associate degrees and 18% more likely to earn bachelor's degrees compared to students in traditional high schools.[10] The impact of ECHS on postsecondary attainment was found to be stronger for females, minority students, students from low-income families, and students with higher middle school achievement.[11]	�	■	■	■		
P-TECH	A study of P-TECH students in New York City found that 46% were enrolled in at least one dual enrollment course compared with 20% of non-P-TECH students. They were also 38 percentage points more likely to have had an internship, and 5 percentage points more likely to complete an associate degree than their peers.[12] After two years of high school, 42% of P-TECH students in New York City passed the English language arts Regents Exam with high enough scores to qualify for enrollment into the City University of New York, compared with just 25% of non-P-TECH students.[13]	■	■	■	■		
Youth Apprenticeship	A study of Wisconsin's Youth Apprenticeship program found that 76% of youth apprentices continued in their chosen career pathway after high school.[14] A Jobs for the Future analysis of federal data found that the average wage for students exiting a youth apprenticeship program is $30/hour, significantly higher than the median wage for all youth.[15]				■	■	■

Career-Connected Learning Models Across the Country: By the Numbers

Career Academies: There are more than 7,000 career academies across the country.[16]
CTE Dual or Concurrent Enrollment: At least 43 states offer CTE dual or concurrent enrollment.[17]
CTE Programs of Study: Every state and the District of Columbia offers CTE programs of study.[18]
ECHS: At least 32 states and the District of Columbia have at least one ECHS.[19]
P-TECH: At least 13 states have at least one P-TECH school.[20]
Youth Apprenticeship: At least 30 states and the District of Columbia have defined a youth model of apprenticeship.[21]

Crosscutting Policies that Support Career-Connected Learning Models

Each of the evidence-based career-connected learning models discussed in this brief fall under the umbrella of CTE as defined by the federal Strengthening Career and Technical Education for the 21st Century Act (Perkins V), combining academic and technical knowledge to prepare students for college and career opportunities.[22] As a result, the career courses students complete, regardless of model, align with state-approved CTE programs of study as required by Perkins V. These programs of study are designed as coordinated, non-duplicative course sequences aligned with labor market demand, with multiple entry and exit points that culminate in a postsecondary and/or an industry-recognized credential.[23] CTE policies and programs in each state are overseen by a state director who works out of the state's K-12, postsecondary, or workforce agencies.[24]

For state policymakers looking to strengthen and scale high school opportunities for students, there are four critical opportunities to align this federal support in service of career-connected learning models.

Statewide Articulation Agreements

✦ **Career Academies | CTE Dual or Concurrent Enrollment | ECHS | P-TECH | Youth Apprenticeship**

A central component of many career-connected learning models is that learners can earn postsecondary credentials, making policies that govern statewide articulation agreements key to its success. State legislatures can require community and technical colleges and four-year institutions to develop statewide articulation agreements (also referred to as transfer agreements) to include college credit earned in high school.[25] Perkins V encourages states to require articulation agreements. States can select postsecondary credit attainment through dual or concurrent enrollment as one of its secondary CTE program quality indicators under Perkins V, which 13 states have done.[26] Meanwhile, 28 states include dual enrollment or articulation in their CTE program approval process.[27] State agency officials

should create statewide articulation agreements that ensure CTE credits earned in high school through any career-connected learning model reliably transfer and "stack" into postsecondary credentials. This can prevent dead-end certificates, reduce wasted time and cost, and unlock rapid, equitable scaling of career pathways.

Statewide Approval Process

✦ **Career Academies | CTE Programs of Study | ECHS | P-TECH**

Perkins V requires that each state plan include the process by which programs of study will be approved, which in turn provides a foundation for many career-connected learning models.[28] States can build a consistent foundation of quality for CTE programs of study by creating a single, statewide program approval rubric.[29] This ensures that schools only implement programs of study that support student achievement outcomes aligned with statewide goals, such as credential attainment, work-based learning experiences, and postsecondary credit attainment. By creating a consistent approval rubric for career-connected learning models, state agency officials can reduce costs for districts and postsecondary partners, foster replication, and create a predictable "seal" that postsecondary institutions and employers can trust, which increases partner willingness to participate and accelerates district adoption. More than 20 states allow students to earn a separate diploma or endorsement for completing a state-approved CTE program.[30]

Employer Engagement

✦ **Career Academies | CTE Programs of Study | ECHS | P-TECH | Youth Apprenticeship**

Employers are essential to the design of high-quality career-connected learning models, including ensuring that students have access to meaningful work-based experiences and can earn industry-recognized credentials that employers value. Program policies must ensure that employers are informing both of these outcomes. State agency officials should engage employers in the design of programs of study to ensure those programs lead to credentials of value, and in the development of work-based learning frameworks to ensure employers offer experiences aligned with key outcome indicators.[31] Perkins V requires that states and local recipients engage employers as part of a comprehensive needs assessment process which is designed to support data-driven decision making for planning, spending, and accountability for CTE programs.[32]

Credential of Value Frameworks

✦ **Career Academies | CTE Programs of Study | P-TECH | Youth Apprenticeship**

Building strong employer connections and providing transparency to students on how credentials translate to jobs after high school is critical to ensuring alignment with workforce needs. Thirty-four states have processes in place to formally approve credentials at the high school level for use in accountability and funding decisions.[33] By creating a credential of value framework, state education agency officials, in partnership with workforce development boards and departments of labor, ensure employer validation of key outcome indicators, build transparency for students and families, and support the portability and stackability of credentials earned.

Building and sustaining individual models can also require tailored policy supports that address their unique operational needs.

What Policies Support Individual Career-Connected Learning Models?

While crosscutting policies can provide an essential backbone for many career-connected learning models, building and sustaining individual models can also require tailored policy supports that address their unique operational needs. Exploring these model-specific policies illuminates how states can bolster program quality and expansion within the broader career-connected learning ecosystem.

Model-Specific Blueprints or Frameworks

✦ **CTE Programs of Study | ECHS | P-TECH | Youth Apprenticeship**

States often develop, or adopt nationally created, blueprints or frameworks that define elements, partner roles, and quality expectations.[34] For instance, a framework for a high-quality youth apprenticeship might provide clarity on entry requirements, articulate alignment to sought-after skills, and detail important wraparound supports.[35] Clear blueprints and frameworks for school models align districts, institutions, and employers around shared goals, reduce duplication, and set accountability metrics. This process improves the fidelity of implementation among districts adopting these models and, in doing so, helps ensure students are better prepared to meet key state outcomes such as credential attainment, postsecondary credit, and long-term employment. State policymakers should encourage state agency officials to develop blueprints or frameworks for evidence-based career-connected learning models, so that schools and districts that wish to adopt and launch the models have a clear understanding of program components and quality.

Funding for Postsecondary Partners and Districts for Dual or Concurrent Enrollment

✦ **Career Academies | ECHS | P-TECH | Youth Apprenticeship**

State legislators have an important role in setting up the funding mechanisms that underlie many models. CTE dual or concurrent enrollment programs, and models that intentionally embed dual enrollment, require a predictable and shared-cost funding mechanism that incentivizes postsecondary institutions and district partners to work collaboratively, ensures both partners receive funding

proportionate to the services provided, and avoids creating a financial burden for students. Without a well-designed funding mechanism, K-12 districts and postsecondary partners can end up at odds over who pays a student's tuition and how much tuition is, or students may be left to pay tuition themselves, limiting access to those from lower-income households. State policymakers can avoid this by establishing policies that define the cost-sharing structure and allocating funds to enable participation for all students.[36]

Secondary CTE Course Instructor Certification and Supports

✦ **CTE Programs of Study**

Offering high-quality CTE courses and programs of study in high school requires instructors who have the necessary skills and expertise. However, those with the industry expertise needed can often earn a higher wage outside the classroom and/or lack the certification necessary to teach in a public school — leading to challenges in recruitment and retention.[37] State directors of CTE report the greatest teacher shortages in manufacturing, information technology, health sciences, and STEM CTE courses.[38] Legislators and state agencies can employ a variety of approaches to solve these problems, including alternative teacher certification pathways, allowing work and externship experiences to count toward CTE teaching certification, and providing mentors and professional development support to CTE teachers.[39]

Tri-Party Agreements for P-TECHs
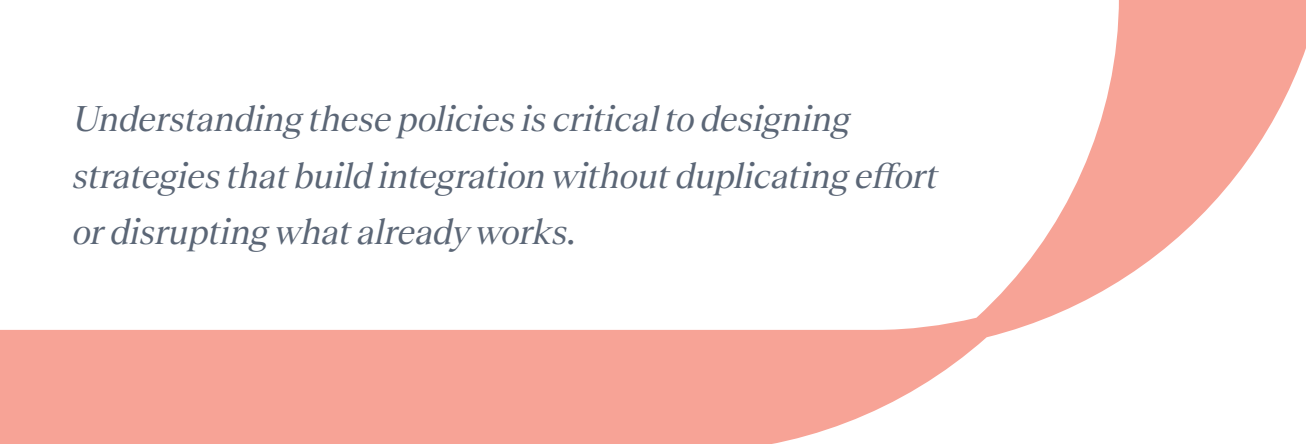
✦ **P-TECH**

P-TECHs are a unique partnership between school districts, postsecondary institutions, and employers, and their success hinges on the strength of these relationships. State officials can support this by requiring formal agreements between all three parties as part of the model blueprint and approval processes. These tri-party agreements, such as a memorandum of understanding, between the three entities should at a minimum define their roles, cost-sharing, and outcome metrics.[40]

Funding and Employer Incentives for Youth Apprenticeship Systems

✦ **Youth Apprenticeship**

Sustainable youth apprenticeship systems rely on braided funding across state, federal, and private sources, along with employer incentives such as tax credits or wage subsidies. State policymakers can help identify and combine funding sources, especially from federal programs like Perkins V, the Workforce Innovation and Opportunity Act, and the Every Student Succeeds Act, and supplement federal funds with state dollars to support and incentivize strong student advising, stakeholder coordination, or employer participation.[41] Maryland, for example, offers up to $15,000 per year in tax credits for employers hiring youth or adult apprentices.[42]

Understanding these policies is critical to designing strategies that build integration without duplicating effort or disrupting what already works.

Conclusion

The career-connected policies summarized in this brief often support the development of individual models. However, they can also serve as the scaffolding for broader alignment that leads to a statewide cohesive career-connected learning ecosystem, that incentivizes districts to consider and adopt multiple models based on the needs of students and employers in their region. Understanding these policies is critical to designing strategies that build integration without duplicating effort or disrupting what already works.

The vision of a cohesive career-connected learning ecosystem may represent a new level of coordination; however, it does not require starting from scratch. The crosscutting and model-specific policies in this brief provide both the regulatory tools and institutional relationships needed to connect multiple models under a single, coherent framework. Scaling What Works: Lessons on Creating a Career-Connected Learning Ecosystem From Four Leading States profiles how some states have leveraged and built on existing structures to begin aligning vision, resources, and accountability systems across multiple pathways to better serve students, employers, and communities. ✦

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About Bellwether

Bellwether is a national nonprofit that works to transform education to ensure young people — especially those furthest from opportunity — achieve outcomes that lead to fulfilling lives and flourishing communities. Founded in 2010, we help mission-driven partners accelerate their impact, inform and influence policy and program design, and bring leaders together to drive change on education's most pressing challenges. For more, visit **bellwether.org**.

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